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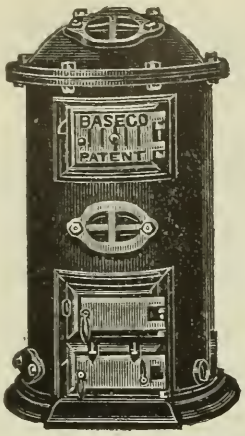

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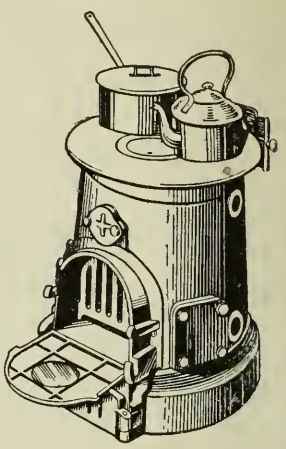

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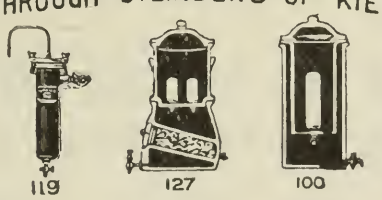

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J. E. B. Seely Maj.-Gen.

MAJOR-GENERAL THE RIGHT HON. J. E. B. SEELY,
C.B., C.M.G., P.C., D.S.O., M.P.

Lord Lieutenant of Hampshire.

PRESIDENT OF THE BOURNEMOUTH CONGRESS.

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JOURNAL

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CONGRESS AT BOURNEMOUTH.

Inaugural Address, by MAJOR-GENERAL THE RIGHT HON. J. E. B. SEELY, C.B., C.M.G., P.C., D.S.O., M.P., President of the Congress.

AS Lord Lieutenant of Hampshire, and as one who saw the vital importance of Health Organisation in the Army during the war, it gives me much pleasure to preside over this meeting held in the healthiest town in the Kingdom.

Four very important principles at basis of the whole of this Sanitary Congress :—

(i.) *The vital necessity of the Health of the People to the maintenance of the British Empire.*

This implies a need for increase of the Anglo-Saxon race, for it stands for highest ideals and purposes ; a need for control of tropics (which is control of health in tropics), and a need for international health.

(ii.) *To secure National Health requires money and organisation of all the various agencies to one purpose.*

It is not a matter of chance. Value of such a congress is that it seeks to co-ordinate and unify sanitary science, epidemiology, engineering, maternity and child welfare, personal and domestic hygiene, industrial welfare. No one of these movements will give us national health. We need them *all.* We must keep on improving the environment, as the Darwinians teach us ; we must also keep on fortifying the individual man, as the Galtonians teach us. All this costs money, but it is well spent, if it gives us health, for without health *nothing* can be done. Pestilences, plagues and a high death rate sap the vitals of a nation.

(iii.) A third principle is that the Health Policy of the nation should not be merely the prevention of disease and premature death,

but the increase in *human capacity* and happiness of the people. It is not only more people that are wanted—but better people, a stronger race, a keener intellect. We are not really a C3 people (as the war proved), but our physique is impaired.

(iv.) Lastly, it is by the *education of the people in hygiene that reform is to be secured.* We have made great advance in the provision of cleaner towns, better sanitation, good water supply, food control, drainage, sewerage, etc., but we have failed to do enough in the education of the people in regard to the healthy way of life and the following matters need further attention :—

(*a*) General practice of laws of health ; food, sleep, exercise, the health and cleanliness of the body, etc.

(*b*) Teaching of hygiene in all schools, and Mothercraft to elder girls (12-14).

(*c*) Physical education and recreation.

(*d*) Open air life. Value of fresh air. How to avoid disease and infection, and secure personal health.

Such education is important to the individual in prolonging life and increasing capacity ; but it also creates *popular opinion* in favour of health. Increased franchise, especially of women, demands increased education to secure right assent and guidance and inspiration to sanitary government.

It is the aspirations of the people that inspire Parliament. Therefore, we must win the people in support of the public health. " What is required now," said Sir William Osler, " is *popular education*—not in disease, but in health."

Now, whilst these principles guide us in a general way, we must get down to hard facts and immediate necessities. There are certain things we must concentrate on. But in doing so we must beware lest we get into bad habits of " stunts " ; over emphasising certain aspects to the detriment of others. It is idle to concentrate on urgent problems, if we neglect to *maintain* the ground already won. Take WATER SUPPLY. There has been great advance in the provision of public water supplies, in *quantity* and *quality*. But we must not rest on our oars. The price of efficiency is vigilance.

Or take HOUSING. There is still (*a*) much shortage of houses in many districts, which diminishes personal cleanliness and physique, particularly among women and children ; (*b*) much overcrowding, which raises the sickness rates all round ; (*c*) much insanitation in town and village, which raises the death rate and shortens life. A " stunt " does not solve this problem. Steady and persistent work in every district, over a number of years, is the only true way of solution. We must keep on teaching local

Sanitary Authorities, Parliament and the people that insufficient or unsuitable housing causes the above.

Or take the FOOD SUPPLY, *e.g.*, milk and meat and shell-fish. We can never afford to relax efforts. I would like to see large development of the dairy industry in England. Why should Denmark lead in this business? We also have agricultural genius, and we want *more* milk and *cleaner* milk. In spite of faddists and newspaper stunts, milk is of *immense nutritive value*, and we want more of it and not less. How can we best secure increased supplies of pure milk?

(*a*) By the *consumer*, if he demands clean milk and protects it from uncleanliness in his own house.

(*b*) By the *Dairy trade*, whose interest it is to conduct its trade in a clean and scientific way. The "grading" of milk and the production of superfine "certified" milk is one of the chief ways of raising the standard;

(*c*) By the *Sanitary Authority* putting into force its powers of control of adulteration, uncleanliness and infection.

The inspection and control of meat supplies is another illustration, and the recent Departmental Committee on Meat Inspection has done good work, and the new instructions from the Minister of Health in regard to uniformity of inspection, the standards of condemnation of bad or diseased meat, and the qualifications of meat inspectors are all to the good.

I mention these illustrations of sanitary work which, whatever else we do, must be carried on. Because improved environment since the great Public Health Act, of 1875, has had a wonderful effect in raising the public health is not a reason for dropping it or ignoring it, but for *pressing on* with it. The same applies to the really wonderful work which has been done in dealing with epidemic diseases, with tuberculosis and with venereal diseases.

There is much current criticism of the public expenditure on these subjects. But I have no sympathy with it. We simply cannot afford to save money on these subjects. There *are* departments of Government action and intervention where substantial reduction of expenditure must be insisted upon. But not *here*. For what do we find?

We find large tracts of Europe devastated *with epidemic* disease, and we must keep our sanitary cordon intact and awake and ready. The protection by our port sanitary authorities is imperative. It is not a luxury, but a vital necessity. It has kept back cholera for three generations.

Or take TUBERCULOSIS. In the decennium 1851-60 our death rate from tuberculosis was 2,817 persons per million living per annum, but we got to work under the Public Health Acts, and in 1920 it had been reduced to 843 per million living—an enormous decline, due to sanitary and social advance.

People talk about tuberculosis and its gravity—and they are right—but they must learn that the attack on tuberculosis is going forward, and that with unity of command and all sections and divisions in the army of attack active—the attack will succeed. They must understand that this disease is steadily declining.

Or take Venereal Disease. In 1917 the nation was making no concerted attack on V.D. We were drifting. But now we have 194 treatment centres, with 800 weekly sessions, with 384 specialist doctors, and in 1921 dealing with 84,000 persons, who between them made 1½ million attendances. Now there is new provision, in addition to existing hospital accommodation—and there can be no manner of doubt that such a system of treatment can have only one effect—the disease will be diminished and, it may be, stamped out.

Now all this work must continue and be steadily driven home. There must be no money *wasted*, but the relatively small amount needed must *not* be withheld, for it is invested in the best of all investments.

There are three aspects of the public health upon which I want to urge advance. The first is maternity and child welfare. We lose 3,000 mothers a year in child-birth (or approximately 4 in every 1,000 cases of child-birth), and we lose 70,000 infants a year before their first birth-day—more than a thousand baby funerals every week. This loss is still serious, though during the last ten years there has been, as everybody happily knows, wonderful, indeed astonishing, improvement. Let me give you a few figures :—

Saving in Infant Lives.

1871-80	= 149.	1891-1900	= 153.
1881-90	= 142.	1901-10	= 128.

Infant Mortality Rate per 1,000 Births.	Year.	No. of Births.	No. of deaths under 1 year.	Lives saved on 1911 Infant Mortality Rate.
130	1911	881,138	114,600	—
95	1912	872,737	82,779	30,676
108	1913	881,890	95,608	19,037
105	1914	879,096	91,971	22,311
110	1915	814,614	89,380	16,519
91	1916	785,520	71,646	30,471
96	1917	668,346	64,483	22,401
97	1918	662,661	64,386	21,759
89	1919	692,438	61,715	28,301
80	1920	957,782	76,552	47,959
83	1921	848,814	70,250	40,095
Total	1912-21	—	768,770	279,529

It is not surprising that last week His Majesty the King expressed his approval of work which gives such remarkable results. What is the secret of it? An increased attention to *mothering*. There are 1,800 infant welfare centres, the 3,000 health visitors, the mid-wives, the maternity homes (of which Her Majesty the Queen has given us such an admirable example at Hampstead)—all these things are having their effect on English mothers. But in many places, I hear of curtailment, of closing centres and of discharged health visitors.

I hear of the same sort of curtailment in the name of economy in the School Medical Service which looks after the 6,000,000 children in our elementary schools. I hear of the discharge of officers and of the proposed restriction of school inspection and of school clinics (of which I rejoice to know that there are nearly 1,000 in active operation), and there is all through the school medical and public health services widespread disappointment and distress at the activities of the so-called economists. Yet the fact remains that the School Medical Service is not only saving thousands of children's lives every year, but is laying the foundation for a healthy nation in years to come. It does not require a very exceptional common sense to see that long before we attempt to educate a child we must ensure that a child is in a condition, physically and mentally, to receive the education which we provide. All the education authorities are carrying out medical inspection, but the law requires that they should also provide, or make available, the means of medical treatment. I am informed that out of 317 Education Authorities there are 76 that have made no provision for the treatment of DENTAI DEFECTS, there are 26 that entirely neglect the treatment of DEFECTIVE VISION, and there are 95 that make no provision for the treatment of diseases of the throat and nose, which happen to be particularly common in children. In many districts there seems to be an inclination to go back rather than to go forward, and I feel sure that this must be due to the fact that the people in those districts do not understand the immense benefits which the School Medical Service has brought to the healthy as well as to the defective children.

It is sometimes said that if we were to leave the weakly to die the State would be stronger and healthier, but if the unfit child is to be neglected in such a way (and only the superior or fit child preserved) we must decide how to do it:—

Which children are to be neglected?
Where—at what age?
Who is to neglect them?
What will be the effect of such neglect on the race as a whole?

Such propositions are impossible, and would carry us back to barbarism.

Under such a system we should have allowed Sir Isaac Newton and Lord Nelson to die, both of whom were in frail health in their youth.

Another subject to which I want to refer is that of INDUSTRIAL WELFARE. I am glad that a section of this Congress is to deal with this subject. Much broken time and much absence from work, as well as a substantial degree of unemployment, has been proved to be due to the physical impairment of the worker. Business men know that time broken because of sickness or accidents is a serious matter. It has been estimated that the time lost by *insured* men and women suffering from sickness or disablement amounts every year to *270,000 years*. That is to say, we are losing in the insured population only (equal to 14,000,000 persons) the equivalent in output of 270,000 persons all through the year. This is a great loss in money, in capacity, and in output. Public health is concerned not only with death rates, but with capacity for work and for enjoyment of life, and if in all trades there is loss of life and capacity owing to preventable sickness or disablement, the nation is foolish to ignore it.

It is not only a question of a fit workman, but of the fitness of the work to the man. It is not economy to damage your workman by the work which you give him.

The Vote of Thanks to Major-General Seely for his Address was proposed by The Earl of Malmesbury and supported by Dr. H. Cawadias, representing the Government of Greece; The Hon. John McWhae, Agent-General for Victoria; and Professor T. A. Starkey, of McGill University, Montreal.

CONGRESS SERMON.

THE Lord Bishop of Birmingham gave a very helpful and encouraging sermon to Members at the beginning of the Congress. In the course of his sermon he said there were two very remarkable things in English civic life, and both of them were matters for which they might have some reasonable satisfaction and thankfulness. The first was the very great quantity of public work which was done voluntarily by some of the most intelligent and progressive people in the country—men ready to give their time and talent to help forward what they believed to be for the good, sometimes of the town in which they lived, and sometimes of the country itself. The other point was exemplified by that service, namely, that in all our great civic undertakings religion was recognised, and they asked the power of God over their deliberations and efforts. They came to God's house that day not because they were all church people, but because they wanted their deliberations to be sanctified, and because they wanted it to be acknowledged that from God came their power to work and to make the work what God would have. The work of the Royal Sanitary Institute was a sacred duty, for there was no such thing on God's earth as secular work. They had come to a town perhaps more remarkable than any other in England as a health resort, known practically all over the world as one of the leading places in England where people came to gain freshness and vigour to continue their life's work. Health questions, although they might mainly touch the body, also closely touched the moral and mental well-being of the land. They were going perhaps to take a backward look and also to take counsel as to the future—to give a thought as to what the great medical service of the country should be in the future. They were going, perhaps, to think a little about what would happen to the hospitals of England in the days that lay before them. Were they to lose that voluntary system which seemed to be at present in a very critical state ? Those of them who really valued character were prepared at once to say, if only it could be done, if only justice could be done to those who fell by the way, that the voluntary system was the nearest of all to the mind of God : " Bear ye one another's burdens, and so fulfil the law of Christ." His lordship reviewed the various aspects of the coming Congress, and pointed out the importance of a healthy environment for the children, and of a healthy body in the creation of a healthy mind. He impressed upon them the dignity of their work and reminded them of the happiness they might bring, especially on the poor, by the provision of healthful homes and surroundings.

CONGRESS LUNCHEON.

Welcome by The Worshipful the Mayor of Bournemouth (Alderman C. H. Cartwright).

THE Mayor, proposing the toast of the "Royal Sanitary Institute," spoke of the pleasure it afforded him, as Bournemouth's civic head, of testifying to the great services that had been rendered to the public health of the country by the Institute. He expressed high appreciation of the honour done the town by making it the venue of Congress of the Institute this year. The Congress, also, would afford his fellow citizens an opportunity of learning the great educational influence the Institute was bringing to bear upon all those who were engaged in administering the Public Health Acts of this country. He hoped the 33rd annual Congress would be as fruitful of good work as any of the memorable Congresses that had preceded it.

Speaking as the head of a municipality, he must also bear testimony to the great debt that those upon whom fell the carrying out of the Public Health Acts of the country owed to the Institute. There were reasons, too, why they should give the Institute their unswerving loyalty and support, for not only were they indebted to it for their own technical knowledge, but it furnished them with that band of qualified experts, to whose aid and assistance they were so greatly indebted.

The Mayor also paid tribute to those men whom the Institute had instructed in sanitary science, to many of whom it had granted diplomas and who, as inspectors, had discharged their duties so ably to the various Corporate bodies.

Happily, they in Bournemouth possessed a municipality that was not unmindful of their obligations to the Institute, and was striving to bring about by every means possible, an ideal system of sanitation as befitted a town that claimed to be a first-class health resort; to ensure as far as was humanly possible, freedom from all kinds of infectious disease; to see that the playing fields of the town were adequate for young and old alike; and that the houses they built should not only be sanitary, but planted in a small garden of delight, such as had made Bournemouth the garden city of the South.

All the things he had mentioned could and would be brought about, but they must look to the Institute for guidance and for help. It was his fervent hope that the Institute might go on with increasing zeal in the noble work it was doing.

Dr. Louis C. Parkes (Chairman of the Council of the Institute) acknowledging the toast, expressed indebtedness to the Mayor and Corporation for inviting them to "this very beautiful city." They were additionally grateful for the Mayor's very able speech in keen appreciation of what the Institute had done in the past, what its work was now, and what it was likely to be. With regard to Bournemouth itself, they all knew its beauties, so that there was no need to dilate upon them. The Corporation had brought out an illustrated souvenir of the Congress, in which he had observed with interest a very helpful study on the subject of tides.

The Institute represented a great number of interests of different classes of workers, and the Congress was the means of bringing these together for an interchange of ideas and views. No doubt a very great deal was learnt in this way, one area benefiting from the experience and ideas of another area, with, of course, the appropriate modifications for local circumstances. The tendency was for these Congresses to level up the health work of the whole community. Instead of having isolated communities comparatively unprogressive, all the local authorities sent a delegate to that Congress, there to assimilate what was new, with results which made for progress in those isolated communities. The Congress met in sections ; papers were read and discussed, thereby contributing to the advancement of knowledge. By simply discussing what was desirable and practicable, and what was undesirable and impracticable, and by generally exchanging opinions on many schemes and methods, they arrived at a basis of co-relation and decided as to the most systematic lines on which the health work of the country could proceed.

Without such work, there would be a strong tendency in any developments of the work in which they were all the time engaged, for some places to make a rapid advance, while other places would lag behind. Another aspect of their work at the Congress, was the instruction of the general public. This was a very necessary thing indeed. Without an informed public opinion, they could not go very far forward, for if they got in advance of public opinion they would be likely to have opposition to their ideas. They might almost put this aspect of their work in the forefront of their Congress.

Apart from the actual work of the Congress, there was its social aspect. Those gatherings were also extremely important in uniting them in a common bond of brotherhood. They got to know each other as personalities, and not as abstractions.

Sir Arthur Newsholme, K.C.B., M.D., proposing the toast of the "Mayor and Corporation of Bournemouth," and having expressed appreciation

of the hospitality of the Mayor and Corporation, referred to the value of that hospitality in promoting the interests of the Institute's work from a public point of view, Sir Arthur said that in England they had learnt the secret of local self-government when attempts at it in other countries had often proved a grievous failure. When they thought of the obligations of local government—the administration of its various departments, its police, health measures, recreations, electricity, gas undertakings, and so on—they realised the extent of the training and experience needed to make the perfect business man.

To the Corporation of Bournemouth they realised how much they owed for enabling them to meet together in that town. They hoped to learn in the course of their stay in the town how much local self-government could do in such a place as Bournemouth, flanked as it was by the New Forest, and favoured with one of the most beautiful bays on the English coast. In addition to other great natural advantages Bournemouth undoubtedly had excellent local self-government. They had come there to learn, and no doubt they would learn to greatly appreciate the kindness of the Mayor and Corporation in inviting them to Bournemouth.

Alderman J. E. Beale, J.P., chairman of the Health Committee of the Town Council, responding to the toast extended a cordial welcome to the Congress, and remarked that the work of committees such as that over which he presided was done without flourish of trumpets. He sometimes felt, in fact, that other committees of their local authorities had a greater advantage over them in regard to the work they were able to point to, but the work of a health committee in a town like Bournemouth was none the less considerable because much of it was hidden from view.

CONGRESS AT BOURNEMOUTH.

CLEAN AIR.

Popular Lecture by LEONARD HILL, M.B., F.R.S.

MEN and women live long who work in the clean open air of the fields; thus the expectation of life (1911–12) of females at birth in Westmoreland was 61·7 years, in Middlesborough 46·7. This is not merely a matter of greater infant mortality, for at age 15 the difference is 5½ years. Similarly, for young adult females Surrey county had an advantage of 9 years over smoky industrial Oldham, while the urban mortality per 1,000 living on the whole for males is one-third greater than the rural mortality, a proportion which has not changed in the last 50 years, although the mortality has been generally lowered. This difference is very striking considering the good water supply, drainage and cleaning of the cities and the higher wages earned by city workers.

In the medical grading of the recruits for the Army in 1917, over 70 per cent. of coal miners, who did strenuous work in well ventilated mines, with good pay and ample holidays, were graded I., while only 20 per cent. of a sample of cotton operatives were so graded. Taking the clergy as a standard on account of their more blameless lives and greater freedom from drive and stress, we find at 35-45 the mortality per 1,000 for the clergy was 3·15, for agricultural labourers 4·9, for cotton operatives 6·52, and for shoemakers 7·83. At age 55-65 the respective figures were 21·92, 17·32, 36·70 and 26·13.

We have done in recent years a great deal to reduce infant mortality and to preserve and make happier the life of young children, but we have done much less to extend the life of the adult. Dr. Greenwood has pointed out that Sweden has a higher mortality in later childhood and adolescence than we have, but stands far better in the length of life and continuance of working power of its adult population. Thus the mortality figures for males, 1906-10, are, ages 15-20: England 3, Sweden 4·3; ages 35-45, 8·6 and 7·1; ages 55-65, 31·0 and 20·1. In 1916 (the latest figures before me) Swedish males 45-55, 55-65 had 10·01 and 19·35 as rates of mortality. In 1920 (our lowest record) 13·3 and 25·2 are the English rates. Our men of 45-55 died faster than the Swedes in 1916.

In this country tuberculosis still kills and maims each year almost half as many civilians as the great war did of our soldiers; in 1920, 42,545 persons died of tuberculosis, 9·1 per cent. of all deaths. In Japan there is now happening just what happened in England during the rise of industry at the beginning of last century. Some 210,000 fresh girls are coming annually

into the cotton mills from the country districts, while some 80,000 girls in the mills are annually discharged for sickness, and no less than 70 per cent. of all their deaths is due to tuberculosis.

There are two chief factors at work undermining the health of the city worker, firstly, an ill-chosen diet; secondly, confinement indoors in dim sunlight filtered through glass, in a stagnant atmosphere, with the body generally overclothed and kept too warm.

Ill-nutrition may arise because food is deficient in energy value or in quality, or because the environment depresses the fire of life, and reduces the healthy action of the bowels and the appetite, or because the body is over-fatigued, and the expenditure of nerve energy leaves insufficient for the digestive and absorptive functions. In Prussia 56,861 persons died of tuberculosis in 1913. In 1919 the smaller population, weakened by privations, suffered 85,996 losses from this disease. Over-fatigue is, no doubt, one of the great causes of consumption, and those who carry out in factories skilled-hand operations, doing piece-work or keeping up with the pace set by a machine, seem specially liable to it. Heavy workers suffer far less, *e.g.*, coal miners, smiths and foundry men, and agriculturists. Boot and shoe makers, printers, and cabinet-makers have a relatively high mortality from consumption. Merchant seamen who are confined in very close quarters on board ship have a rate thrice that of coal miners. Heavy workers make realtively few movements (moving legs and body as well as arms), they breathe deeply, have a high rate of food oxidation, and require, and generally secure, good ventilation, many working out of doors. The light hand-workers lead a far more caged and less well-ventilated life, using their hand muscles to make many small, fine movements, not using their big body and leg muscles, not breathing deeply, not having a high rate of food oxidation. The chest is fixed to make skilled hand movements, and this modifies their breathing. The number of fine skilled movements they have to make brings about nervous fatigue, while their food oxidation being relatively low, and breathing shallow, the onset of fatigue is not resisted as it should be by a high rate of nutrition. The relatively warm environment brings too much blood into the skin of the factory workers, and does not tone up the body as the open-air life does. Infection with catarrhal complaints is far more spread among them, and their respiratory membrane is not kept in a healthy state as it is in those who breathe deeply cool air. Children who are over-crammed for examinations come under this category, so too, many college students and clerks.

Insurance returns show that in some occupations 40 per cent. of the workers may be away from work each year for some period owing to sickness, while the number of cases seeking medical relief may number 100 per cent.

of the workers or even more each year. The economic loss is gigantic. Sir George Newman estimated that the working population loses more than 270,000 years of working time annually from sickness.

Millions live in one to three-roomed tenements, and the cinema and a sensational Press take the place of fun and frolic in the open air. The caged, crowded life of the tenement lowers the vitality and exhausts the nervous system. Ill-feeding comes on top of this ; the workers having no garden to give them fresh vegetable foods. An enormous economic loss results from their having no chance of spending their leisure hours in gardening and in improving their homes.

It is recognised by educational authorities that children require a change, and a run round in the open air every hour to keep them fresh for lessons. Factories should be built narrow, so that they can empty quickly, with playing courts around, where workers, whose needs are no less, can secure a few minutes' relaxation. The building of acre-big workshops is against the reasonable control of the workers' health. A greenhouse atmosphere is often obtained in big factories lit by skylights.

Children require change in their lessons, and a change of occupation is as good as a holiday. No attempt is made to bring this about in factories. By changing shops and changing work, hateful, depressing monotony would be avoided and freshness obtained. There are workers who follow all day exhausting operations, which brings them to an early breakdown. A change to a light, easy occupation for half the day could easily be arranged by wise co-ordination of work in factories. The war has shown how quickly a man, a boy, or a girl learns a process which was considered skilled. It is nothing to human endeavour to learn half a dozen processes, and escape from monotony by changing from one skilled occupation to another. Let the workers see to this : it is up to them to bring about such a change. At present trade union leaders are far from recognizing this human need.

The wild animal picking up natural food, living out of doors in the open air and sunlight, sleeping in well-ventilated thickets, protected by a light layer of fur, lives a life endangered by enemies, but happy in the perfect condition of his body. To run down the wild asses of Sind the hunters must have relays of no less than five fresh horses—" they snuffed up the wind like dragons." On the other hand, civilised man has to have a book some hundreds of pages long merely to catalogue his diseases. Dr. McCarrison describes in the remote Himalayas a tribe of magnificent physique, preserving until late in life the characters of youth, unusually fertile, with stable nerves. Porters of such a tribe carried, according to General Bruce (of the Everest expedition), loads of over 100 lbs. up a pass ascending 5,000 ft., to an altitude of 14,000 ft. One girl so carried a tent weighing 160 lbs. ! Their food is milk

and eggs, grains, fruits, and leafy vegetables. They have no tinned foods or millers' refined food products, almost no sugar, and very little alcohol. Their bodies are vigorously exercised in the clean, cool open air and bathed with sunlight. Amongst these there is no dyspepsia or neurasthenia, no gastric or duodenal ulcers, no appendicitis or mucous colitis, little or no cancer. Dr. McCarrison says that the chief wanted him not to operate for senile cataract, but to provide a lethal chamber for the old, and so mitigate the trouble of over-population. The old custom was for the son to carry his aged parents in a basket to the top of a rock and cast them down. Over-population drove some families of this tribe into settlement in a new district with poor soil ; there, living too largely on vetch in place of wheat, a paralysis resulted due to excess of this foodstuff. Here we see the effect of ill-balanced diet. Similarly, wild monkeys taken from the woods and kept in big, dry cages with properly chosen natural foods, live healthily, but on ill-balanced foods and so-called " purified " millers' products they develop diarrhœa and dysentery.

We must have in our food, first, sufficient fuel value, or energy, to keep up our body heat and to do muscular work on. Next we must have proteins which will yield us on digestion all those amino acids, into which proteins are split on digestion, and which are required to build our tissue ; to secure these we want variety—best both animal and vegetable proteins. Some proteins, for example, zein in maize, fail in one or other of the required constituents, and disease results from restriction to such. Then we need carbohydrates and fats mainly to provide fuel, but also to help build body substance. In addition, we must have certain salts, and particularly chlorides and phosphate of sodium, potassium, and calcium, on which the processes of life intimately depend. Lastly, the food must contain vitamines, traces of certain vital substances which have hitherto not been separated but have been proved to exist by feeding experiments. The vitamines have been compared to the sparks which fire the petrol in a motor engine. A mixed diet of fresh meat, milk, butter, eggs, fruits, honey, molasses, vegetables, and wholemeal bread, such as our ancestors ate, supplied all, but now this food is largely replaced by the products of the miller and canner, by white bread and polished white rice, cornflour, sago, tapioca, tinned meat, sterilised milk, sugar, margarine made out of nuts, egg substitutes, tinned or bottled fruits. Tea, sugar, white bread, margarine, and low-quality jam are the staple foods of the very poor. The effect of preservatives and refining processes has been to lessen the vitamines and essential salts, often with disastrous effect to growth, health and breeding power.

There are three vitamines recognised—Fat-soluble A, vitamine present in certain fats, particularly in cod liver oil, fish roe, liver, egg yolk, butter and

in green vegetable leaves. This is necessary for growth and resistance to infective diseases. Water-soluble B, vitamine present in the seeds of plants, egg yolk, yeast and in many fruits and vegetables, necessary for health and fertility. Its absence causes Beri-beri, a disease which has prevailed in the tropics owing to the polishing of rice, which millers introduced to make it white. Water-soluble C, vitamine present in most juicy fruits and vegetables, its absence produces scurvy.

Fresh, young green vegetables, eaten as salads, gives us all three vitamines, and as cooking largely destroys vitamines, we all ought to eat salads. The miller takes away the germ and outer layer of the wheat berry, and these valuable parts are given to rabbits, pigs and fowls as bran and middlings. We get in white flour a meal robbed of its vitamine B, and of most of the very important salts of phosphorus which whole wheatmeal contains. I would put a tax on white flour and let finely ground wholemeal flour go free ; a just tax for it would promote national health. So too with sugar, a separated product. Indulgence in sweets and cakes made of white flour and sugar may be no less harmful to health than indulgence in alcohol. Rice, cornflour, sago, tapioca, pearl barley, pea flour, oatmeal, split peas and lentils are similarly impoverished by the miller. What we want is wholemeal ground very fine so as to be digestible, whole peas, beans and lentils, salads, fruits and vegetables, milk and butter of cows fed on green grass and so rich in vitamine A. Stall-fed cows' milk is deficient.

Now, the growing of salads which might be possible in gardens and courts, in window boxes and on roofs in our cities, is stopped by the smoke nuisance ; this, too, damages the fields, gardens and allotments, and lessens the supply of vegetable food and of milk of cows fed on fresh young grass, and makes these things costly to city people.

The damage done by smoke to property in Manchester and Salford has been estimated at one million pounds annually, or about one pound per head of population. A similar estimate for London is four millions. The cost of the smoke nuisance regarded as a preventible source of damage to buildings, furniture, fabrics, plant life, and human vitality has been put at 50 millions a year ; taking into account human happiness, health and working power, it is incalculable, but at any rate very large. In 1920 the rate of mortality of England and Wales was 12·4 per 1,000 ; of smoky Manchester, 14·0. In addition, there is a prodigious loss of valuable by-products, which under scientific control might be saved. These by-products can be saved by the distillation of coal in gasworks and the utilisation of gas for lighting and heating and of coke or other smokeless fuel for heating and for raising electric power and light and steam power. Professor W. A. Bone has estimated that over 90 per cent. of the fuel value of the coal used in power production, is

at present wasted. Only 8 per cent. of the fuel value of the coal is obtained as power in electric power stations, and only ½ per cent. of the fuel value of the coal used to produce it is converted into electric light. In contrast to such inefficiency, the luminious efficiency of the glow-worm or firefly is 100 per cent. By carbonisation of coal at gasworks and the use of gas, coke, and by-products some 25 per cent. of the thermal energy of the coal can be secured. The modern radiant-heat gas fires gives us some 15 per cent. of the thermal energy of the coal used to produce it, and the efficiency of the gas boiler is almost as high.

The coke used to generate electricity will give us another 8 per cent. The by-products, such as tar, ammonium sulphate, etc., are estimated to give 6 per cent. By turning coke into electric power and supplying this power and gas for heating to every house, home industries can be revived, and life made immensely happier in garden cities. By using gas, coke and smokeless fuel in place of raw coal we can clean the skies and conserve the national coal stores for foreign barter and future use. With the same output we shall have two or three times as much coal available—what a prodigious folly to continue the waste as at present ! Turn to the effect of smoke on health and happiness.

Smoke covers with dirt people and their houses, causing an enormous expenditure of human energy in cleaning, painting and redecorating of buildings, and washing of clothes. Smoke fogs delay the transport of goods and people, with all the annoyance and loss of time and money therefrom. The deposit of soot at Southwark—39 tons per month per square mile—must be compared with that in a country district like Malvern, where it is only 7 tons. Dr. Owen's experiments show that the pollution from coal smoke in London begins at the time of lighting the domestic fires ; when the fires become hot it is better ; at night it is nearly as small as in the country. If the newly lit fire could by some means be rushed to a red heat there would be much less smoke and fog.

A few years ago the people of Manchester were estimated to receive 50 per cent. less actinic rays of sunlight than the people in Didsbury, 4 miles away. Leeds, it is estimated, receives 40 per cent. less daylight than its suburbs.

The quantity of soot emitted by domestic fires is estimated by Prof. W. A. Bone at 3 million tons, and by factory furnaces at 6 million tons, in all nearly 10 million tons a year. The domestic soot is more tarry and causes more fogs than the blue smoke of factories. The choking of the leaves by tarry matter and the sulphur acids in the smoke destroys vegetation and lessens the pleasure and health derived from the cultivation of gardens and the use and enjoyment of public parks. Radishes and lettuces grown at stages

between the centre and the suburbs of Leeds show enormous increases in size varying with the distance between the producing ground and the city.

As I have already pointed out, the destruction of vegetation is of very great importance to health, not only from the æsthetic side but from the fact that fresh green foods and milk of cows fed on such are protective foods containing the vitamines essential for health, growth and breeding. The want of these is one of the great causes of malnutrition, disease, infertility, and unhappiness in our big cities. Smoke intensifies the natural white mists, and not only cuts off the light but the heat of the sun, and hinders evaporation of water, thus increasing the gloom and cold humidity of the climate, which impels people indoors and to sedentary occupations and pleasures in place of healthy exercise out of doors. The deleterious effects so produced are vastly more important than the blackening of the lungs by inhaled soot or their irritation by sulphur acids.

There are certain dusts which are very harmful to workers, in particular free silica from quartz, sandstone, granite, etc., inhaled by gold and tin miners, grit-stone makers and grinders. Such dust produces a degeneration of the lungs, often followed by phthisis and a very high death rate. It can be stopped by suitable means of ventilation.

The physical properties of the atmosphere are of great importance to health. We are always consuming food and producing body heat, and we have to get rid of our body heat in order to keep ourselves at the normal body temperature. Hard muscular work produces far more heat than food. The skin is cooled by radiation of heat to colder surroundings and by convection—by warming the air in contact with it. Wind greatly aids convection. There is, additionally, the emergency method of cooling the body by evaporation of water. Every gram of water evaporated when one sweats takes away 600 calories of heat.

The bad effect of a warm, moist climate, such as that of Singapore, on the British is established by experience. Every four years long leave in a temperate climate has to be given to re-establish the health of officials, and this is not enough—"many fall by the wayside." The native Malays are incapable of strenuous effort. Indians and Chinese are brought in to do heavy work. Tropical shade conditions of climate are frequently found in one tenement dwellings, ships, mines, and workshops through stagnancy and overheating and humidification of the air.

At the Fall River cotton factories, U.S.A., the death-rate for males between the ages of 15 and 45 is twice, and for females thrice, that of the average. The physical labour of cotton spinning is not great—the most striking features of the spinning-room are the heat and moisure of the atmosphere. In this country respiratory diseases rise to a very high level among the cotton

spinners after middle age. Similarly, in this country, the comparative mortality of potters from phthisis and other respiratory diseases is two or three times greater than that of other males living in the district. The potters too, work in warm atmospheres.

The air which one breathes in, no matter at what temperature it is, nor what moisture it may contain, is heated up to almost body temperature, and saturated with water at that temperature. The important thing is to keep up the health of the respiratory membrane, and this depends upon the amount of arterial blood and lymph flowing through it. During the winter at an Alpine resort, the cold air that one breathes in, having very little moisture, when heated up to body temperature takes a great deal of moisture from the breathing passages. A person living in an Alpine sanatorium, taking exercise and sleeping in the open air may evaporate from this membrane in 24 hours several times the amount of moisture which he would if living a sedentary life indoors in London. This is a matter of great importance, as the flow of moisture going through the membrane cleanses it, protects it from disease, and helps it to cure cases of tuberculosis by sending more lymph and blood through the respiratory tract. It has been shown that the tears and secretion from the nose and respiratory membrane have a very great power of destroying the microbes commonly found in the air.

Cool air evaporates moisture not only from the respiratory membrane, but also from the skin ; hence the dryness of the skin and lips, and their tendency to chap. When doing hard work one has to perspire to keep cool, for the heat production of the body may be five to ten times greater than during rest. In the cold Alpine air in the shade it is possible to take heavy exercise, such as climbing, without sweating ; the heart is thus saved from extra work, and the patient is stimulated to exercise and enjoys it more. Cool winds have the same effect in this country.

In dry, hot atmospheres sweating keeps the body temperature normal, but heat-stroke results if the sweat glands become exhausted through fatigue or illness. Heat-stroke can then be prevented by spraying the patient with water and blowing on him with a fan.

In hot, moist atmospheres loss of heat by evaporation becomes very difficult or impossible ; heat-stroke is inevitable in the latter case. Warm, moist atmospheres lower health and working efficiency very greatly. The body heat production of native students in such climates is not half that of an athletic Oxford undergraduate.

The ordinary thermometer, which is so trusted, merely gives the average temperature of its surroundings. While the human body produces heat, and all day long is keeping itself at body temperature, the thermometer does not produce heat, but just registers the effect of the surrounding atmosphere

upon itself. An instrument is needed, then, to record how quickly air cools and evaporates moisture from the body. The lecturer had introduced the Kata-thermometer, a sensitive instrument, and one that was considered far more indicative of human feeling than the ordinary thermometer. The Kata, as it is called shortly, is simple and easy to use ; it recorded not only the effect of the temperature of the surrounding air on the cooling of a surface at body temperature, but of the wind and any movement of the air, and also how quickly cooling takes place when the surface is wet, as the skin is when perspiration is going on. The Kata is a large-bulbed alcohol thermometer of standard size with stem graduated from 100° to 95° F. It is warmed up in hot water till the meniscus rises above 100° F. ; the bulb is then dried, and the rate of cooling of the meniscus from 100° to 95° F. taken with a stop-watch. With the aid of a numerical factor determined for each instrument the cooling power is deduced in millicalories (1/1000 gram calorie) per sq. cm. (of Kata surface at body temperature) per second. In the case of the wet Kata a muslin glove covers the bulb. In still air the dry Kata-thermometer records a cooling power of 10 at 0° C., and about 5 at 20° C. ; with a wind of 9 miles per hour it has a cooling power of 40 at 0° C., and 20 at about 15° C., and so on with different rates of wind. Wind is far more important than temperature to the cooling of the body ; thus the still, dry, freezing air of the Alpine climate is easily borne. In factories, schools, etc., the reading of the cooling power of the dry Kata-thermometer should not be less than 6 with a temperature of about 60° F., otherwise the efficiency of the worker and pupil will tend to go down. Out-of-door workers face a cooling power in this country hardly ever as low as 6, and generally two and in winter often three or four times as high. Observations made by the Industrial Fatigue Board researchers in pottery, boot and shoe, cotton, and printing works showed that a great number of readings were below 6. The general mortality rate increased in these trades with the lowness of the Kata readings. Great improvements could yet be made, and industrial unrest is to be attributed not so much to the wage question as to the working conditions of life—the confined air, filthy, smoky atmosphere, lack of gardens, playing fields, etc. If factories were properly swept with moving air the risk of massive infection would be greatly reduced, and the workers stimulated to work and kept in better health.

Experiments carried out by Dr. Argyll Campbell and the lecturer at the Treloar Hospital and at the English Sanatorium at Montana showed that the heat production of the body is kept at a high level in children, who lie on cots in the open air, more or less exposed nude to the wind and sun. The patients absorb and enjoy the radiant warmth of the sun, while cool air surrounds and cools the shaded part of their bodies. The body heat production of clothed

adults is put up about 50 per cent., and in the case of children 50-100 per cent., in some instances more, above that of those resting in a confined chamber. The appetite is thus greatly increased, and as the digestion and absorption of food improve, far more food principles, amino acids, salts, vitamines, etc., become available for resisting disease.

The sun warmed diseased parts, and, evaporating moisture from sores and sinuses, maintained a greater flow of blood and lymph through these parts. The cool, dry air also increased such evaporation, etc. Ultra-violet rays were absorbed by the surface and caused pigmentation of the skin, and the pigment prevented sunburn. Patients required to be gradually exposed to the sun and allowed to pigment ; they must not be sunburnt or overheated.

The immense importance of exposure of the body to sunlight and cool fresh-moving air is shown by the wonderful cures effected in cases of tubercular disease of skin, glands, joints and spine, for example, at the Treloar Hospital under Sir Henry Gauvain, the Queen Mary's Hospital for Children (M.A.B.) under Dr. Pugh, and at the Alpine Sanatorium at Leysin under Dr. Rollier, a pioneer in these methods. The children at Leysin play, attend school, and do field work naked except for a loin cloth, and become brown as niggers, not only in summer but in winter. At the Treloar Branch Hospital at Hayling Island they not only play naked on the shingle beach, but bathe in the sea. The exposure to cold which sickly slum children easily and quickly come not only to withstand, but derive benefit from, is astonishing, particularly to those who have been brought up by mothers and grannies in the erroneous belief that exposure to cold is the great cause of illness. You may see a child sitting up in bed at the Treloar Hospital in a draught from a window on a November day with its nightshirt slit up from the neck downwards so that its little body may be well ventilated. It might snuggle down under the bedclothes and put its feet to the warm bottle provided, but it does not care to. It wants to sit up and play, and does not feel the cold any more than a wild animal. The cool moving air stimulates the body to keep itself warm by oxidising the food which, having been eaten is digested and absorbed into the blood. The fire of life is made to burn brighter. Those who shut themselves up in the stagnant air of warm rooms are kept warm artificially, and have the fire of life in their bodies correspondingly depressed to a low level. Cool moving air, by stimulating the oxidising processes, makes us breathe deeper to get in more oxygen, quickens the circulation, and provokes appetite. It impels us to take exercise—the natural method of keeping warm. Exercise, in its turn, makes the circulation and the breathing far more active. The organs within the abdomen are massaged by the movements of deep breathing, and this massage, combined with increased circulation and oxidation, prevents constipation and the poisoning of the body

by products of bacterial decomposition, which may arise in the bowels of sedentary workers. Sedentary life indoors may be balanced by open-air exercise in leisure hours ; but if, as is the tendency, leisure be spent in crowded conveyances, tea shops, drinking bars, cinemas, theatres, meeting houses, and in bed with the windows shut, almost the whole 24 hours of the day are spent in approximately tropical shade conditions.

Some factories, spinning mills and weaving sheds have to be kept at a high rate of humidity for the purpose of manufacture, and in these, by the introduction of steam, the climate is made like that of Singapore. Great improvement can be brought about by the use of fans.

We have a wind tunnel in the Institute of the Medical Research Council provided with a revolving band on which we can walk or run at given speeds, it has a fan for cooling us by various velocities of wind. Observation shows us that adequate cooling keeps down the pulse ; it may be 120 in the wind in place of 150 in still air when doing heavy work. This is because the heart is spared from having to send so much blood to the skin and sweat glands to cool the body. By adequate ventilation, then, heart fatigue may be kept off, and the period of working efficiency so raised. Probably in very many people the heart beat is kept too frequent by over-warm surroundings. People in the tropics grow old quickly and have shorter lives. One cause of this may be exhaustion of the vital power of the heart by its more frequent beat.

It has been shown that the efficiency of the native workers in the South African mines is lowered 50 per cent. where the galleries are hottest, and in a whole mine the efficiency was calculated to be 21 per cent. less than it would be with ventilation, as measured with the Kata-thermometer, adequate to keep the workers comfortably cool. Gigantic economic losses arise, then, from ill ventilation.

Not only consumptives but all cases of fever, for example, measles and pneumonia, are treated with great advantage in open-air shelters. The wounded do exceedingly well in hospital sheds built on the plan of the verandah or in tents, a larger proportion die from septic infections in close, crowded buildings. Delicate children, those subject to colds, those with weak hearts, those over-nervous in temperament, those in risk of tuberculosis, when sent to open-air schools and given good food, adequate rest and open-air exercise, grow so fast in weight that their growth-curves escape from the official charts used for records. Lunatics, too, are soothed and brought to recovery quicker and in large numbers by open-air treatment. Tens of thousands of weedy citizens, conscripted in the war, well fed and exercised in the open air, broadened out and became handsome, virile-looking soldiers,

so developed that their old-time " civvy " clothes were useless to them when they had been demobilised.

Trial has proved that cows, with their natural coat of hair—they have no overcoat to put on—yield more milk and improve more in condition and breed better when wintered out in the open fields than when kept in stalls, and that stall-feeding is the cause of tuberculosis in them. All this is known to the observant, but yet the mass of people are imbued with the fear of cold, of exposure to weather ; they shut up windows, confine their children within doors, over-clothe their bodies, over-heat their houses, and lead a caged life, wholly different from the life of a wild animal, from that of a wild man from whom we are descended, and yet they inherit a body tuned to fight the rough conditions of the world through hundreds of thousands of years of man's existence thereon.

The common belief is that a close atmosphere acts harmfully upon us through the chemical impurity of the air, that there is too little oxygen or too much exhaled carbonic acid in such, or subtle organic poisons supposed to be exhaled in the breath, or from the bodies of people. This erroneous chemical theory has done the greatest harm to the development of our cities, for it has been accepted that, so long as the air came up to certain chemical tests of purity, no mischief was done ; thus slum dwellings and cavernous places of business were permitted by the State to grow up in place of garden cities. The land exploiter and jerry-builder for a hundred years have had their way untrammelled, and we now have vast areas closely covered with mean houses, an evil so gigantic as to be almost irreparable.

The truth is that the concentration of oxygen is never reduced in the most crowded, close atmosphere to anything like the extent it is in mountain health resorts, where the air is attenuated owing to altitude. Further, the concentration of carbonic acid in the depths of the lungs is always kept at about 6 per cent. of an atmosphere, the breathing is so regulated as to keep it at this figure. A little more carbonic acid in the air only excites in us a little deeper breathing, just as exercise does, owing to the production of more carbonic acid in the body, and it is only when the carbonic acid rises to a concentration which is never approached in a close room that any loss of efficiency arises from the deepening of the breathing.

The crews of submarines find on submergence that the confined air can be endured until the carbonic acid reaches 3 per cent. and the oxygen is correspondingly diminished. Fishermen greatly exposed to cold by day shut themselves up in cabins and sleep in an atmosphere where the oxygen sometimes becomes so reduced that the lamp goes out, and no harm comes to them from this. On the plateaux of the Andes there are great cities where the people are acclimatised to a concentration of oxygen equal

to some 14 per cent., instead of the normal 21 per cent. of an atmosphere at sea level.

As to the presence of organic poison in exhaled air, the most careful and repeated experiments by the best physiologists in various countries have failed to reveal this. The assertion that there were such poisons was made on the evidence of untrustworthy experiments, which, unfortunately, gained the widest attention and credence, and popular writers and lecturers on hygiene preach a false doctrine which it is considered almost irreligious to contravert.

Close air, in truth, produces its harmful effects in two ways :—

(i.) Through the spread of infection from carriers of the germs of disease.

(ii.) Through its physical qualities, its lack of adequate cooling and evaporative powers acting upon the skin and the respiratory membrane.

The germs of respiratory infection—colds, sore throats, influenza, measles, etc.—are spread by the spray coughed, sneezed, or spoken out by carriers of these germs, and inhaled in massive doses by those who are in close proximity, or by kissing—a direct contact infection. The germs of typhoid fever and similar complaints may be spread by dust from the soiled clothes of carriers, or by carriers handling food with soiled hands, for example, a carrier recovered from typhoid fever in some cases continues to pass a virulent strain of germ in his urine, and if he be a cook or milkman, his hands, soiled with his urine, may transmit this disease to others. The evacuations of carriers may pollute water or milk supplies through drainage leaking into wells, streams, etc. ; or flies may carry infection from their evacuations to food ; the germs which infect wounds may be spread by dust from skin and soiled clothes or by flies ; the germs of other diseases are spread by the bites of insects, *e.g.*, malaria by the mosquito, while trench fever and typhus are spread by body lice. The germs of venereal disease, potent in after effects and in reducing the efficiency of the nation, are spread by direct contact. The infective diseases not only produce illness and death at the time of infection, but may leave behind degeneration of tissues which weaken efficiency and shorten life.

We want to keep our bodies healthy by sufficiency of good food and exercise in the open air, and adequate rest, so that we can resist infection—this is the first essential. Secondly, we want to reduce the massiveness of infection from the carriers of the germs of disease. We might have been able to withstand 10,000 or 50,000 German soldiers landed on the East Coast, and yet have been beaten by half a million ; so, too, with germs. We become immunised by small doses, and fall a victim to large ones. Natives first coming in contact with the diseases of civilised man are thus unprotected and suffer very greatly in consequence. Places where people are crowded together

require to be very well ventilated. Wind sweeps away spray infection and prevents massive doses being inhaled. Sunlight is a great germicide, killing all the germs it can reach. Milk for babies is kept sweet by cold, while microbes multiply in it when kept warm. Much of the milk that comes to town is dirty. Dried milk, amplified by orange or turnip juice to make good vitamine C, may be used with advantage for babies in tenement homes. Mixed with water for each meal, it is clean.

Diseases spread by the flea, louse, fly, etc., are kept away by cleanliness of body, house and midden. Thorough cleaning, as ordered in the Book of Leviticus, will keep venereal disease even from those who expose themselves to it.

I must now turn to consider more particularly the influence of sunlight. It is known that the light and heat of the sun keeps going the manifestations of life. Plants energised by the sun, and using, as a sensitiser to light, the green chlorophyll, build up their substance out of inorganic materials. This substance is the food of the animal world. Modern theory now suggests that all chemical change, vital and non-vital, is touched off by radiant energy, by light or heat, and that the speed of such change is determined by the intensity of radiation. The sun rays which are most active on living cells, killing these if too strong, are the ultra-violet. These are also the rays that act most on a sensitised photographic film. They are absorbed by the surface, and do not penetrate living substance. They change and in too great intensity destroy, living cells and microbes, but act only on the surface.

The visible rays in part are reflected from the skin, and in part penetrate and are absorbed by the blood. It has recently been shown that the skin can stand, without being scorched, twice as much radiant energy in the form of visible sun rays as it can of dark heat rays, because the visible rays largely penetrate, and, warming the blood locally, are carried away as heat to cooler parts of the body. The dark heat rays, absorbed by the surface of the skin, make us feel warm and stuffy indoors. Out of doors, on the other hand, the blood is warmed by the sun, while the surface of the skin is fanned and cooled by the breeze.

The ultra-violet rays are largely filtered off by glass. Exposure in rooms lit by windows is not the same as exposure to light out of doors. Some French observers claim that the long rays balance the short rays, for example, that the bleaching effect of short rays is checked by the throwing in of long infra-red rays ; so, too, in the case of pigmentation of the skin. If confirmed, these are notable facts. We may suffer from an ill-balanced radiation indoors. In heating our rooms with hot water and steam pipes we expose ourselves to long infra-red rays ; gas fires give us chiefly infra-red and red rays, electric light has the infra-red and ultra-violet largely cut out by glass

globes. While the naked arc light gives us all the rays, the mercury vapour lamp in a quartz globe gives us green, violet, and ultra-violet rays. The flames of a fire give us a nearer approximation to sunlight. There is no healthier means of heating than a blazing log fire out of doors. We like a fire best, but, as it fouls the sky with smoke and cuts off sunlight, we must take to gas or smokeless fuel fires as the next best thing. These and open windows give us the most healthful conditions. The dark heat of steam pipes and the stagnant warm air of shut-up rooms depresses health (exposed as we are indoors to massive infection) and makes us less risistent to catarrh, pneumonia etc.

We know that the sun rays, combined with exposure to open air, acting on the blood and cutaneous tissue, increase resistance to disease. Recently it has been shown, first in Germany, then in America, and now by English workers in Vienna that rickets can be cured in children by exposing them to sunlight even while continuing the ill-balanced diet on which they had developed the disease. We know that rickets affects the children of wealthy Hindus who confine their women and children in the purdah, and not the children of the poor, who are fed on a much less costly diet, but who play in the open air. So, too, rickets affects the children of Glasgow workmen who live in tenements in high houses and get little open-air exercise or exposure to sun, while the children of the Hebrides or West of Ireland cabins have none. The latter get more natural food and more light and air. So, too, with puppies, pigs, cattle and animals in the Zoo, ill-balanced diet and confinement in dark places make for ill-health and greatly depress breeding power. Rats put on a diet of white flour with some of the necessary salts, but deficient in phosphorus, get rickety bones and waste away after a couple of months. Addition to their food of enough salt of phosphorus or cod liver oil or exposure to the mercury vapour lamp or the sun for a short time each day will prevent the formation of rickety bones, while not stopping the wasting away of the animals. The effect of exposure to light can be measured in terms of cod liver oil or salt of phosphorus. The blood of the rats so fed is deficient in inorganic phosphorus, and the daily exposure to light puts the amount of this up. Here we have remarkable evidence of the value of light, and this light must contain ultra-violet rays. Light passing through glass is robbed of the useful rays. What folly to filter so much sunlight out of our lives by glass windows, over clothing and smoke!

The physiologist can help greatly to point the way of happy and healthy life, but ignorance and custom heavy as lead wrap people, and it is problematic now whether our civilisation will not stifle itself as older civilisations have done and die out. Discipline of children in the laws of health, which include moral restraints and a wise control of breeding, alone can save it.

CONGRESS AT BOURNEMOUTH.

SECTION A.—SANITARY SCIENCE.

Presidential Address on the Relative Roles of Compulsion and Education in Public Health Work, by Sir ARTHUR NEWSHOLME, K.C.B., M.D.

IN presiding over Section A of this Congress of the Royal Sanitary Institute, my mind naturally travels back to the Congress of the Institute held in Brighton in the year 1890, where I was at that time medical officer of health. The Congress was presided over by Sir Thomas Crawford, and in this section by Dr. Vivian Poore, who delivered an eloquent and original address on "The Living Earth." To that Congress I contributed a paper on "The Teaching of Hygiene in Elementary Schools" (published in *Public Health*), which I have recently re-read, and from which I venture some short extracts, as being not entirely inappropriate to the continuing circumstances of the present time. I started out boldly by affirming that :—

> "Medical officers of health are Ministers of Health, and there can be little doubt that the help they may give in diffusing a knowledge of the laws of health will be more potent for the public good than all the Acts of Parliament bearing on the same subject."

With youthful ardour, I laid down the democratic principle that "free institutions can only work through the agency of public opinion ; that laws in advance of and not supported by public opinion remain inert and incompetent, and that in the same way the enactments of the Public Health Act and other correlated Acts cannot be enforced without the cordial support of the local authority, the latter being a reflex of public opinion." The general conclusion from all these considerations was that "to ensure the permanent success of public health work the public must be educated ; they must have a sound (if it be only an elementary) knowledge of hygiene" ; and to secure this there should be added to the duties of the medical officer of health, as laid down by the Local Government Board, that of "educating the local governing bodies and the general public in the laws of health."

In the same address the point was emphasised, on which now I would lay even greater stress, that while "nothing but gross ignorance could account for the culpable neglect" sometimes displayed by local authorities and the public, it is indispensable that "the public conscience as well as the public intelligence should be quickened."

I note that at Brighton I paid my tribute to the importance of the work done by the Sanitary Institute in popularising the knowledge of sanitary

science. It can now be added that its thirty-two years further work for the public enlightenment constitutes a national indebtedness to the Institute which can never be adequately paid.

I need not at the moment pursue further the main thesis of that early paper, which was based on the conviction that " our main hope for the future lies in the education of the children " ; in a few minutes I shall remark further on the persistent inadequacy of the cultivation of health ideals, on the partial character of the efforts made to develop in our children the spirit of civic responsibility and patriotism, and the self-control and desire for the welfare of others, without which improvement in national health can never be more than partial.

An important part of the work of the Royal Sanitary Institute has consisted in the maintenance of the Parkes Museum ; and it still retains its essential importance as an embodiment of what is best in structural sanitation.

But the centre of gravity of public health work has changed. Structural sanitation, especially in relation to housing, still has fundamental value ; and our continuing obligation to the engineering skill of the water and sewerage engineer, to the surveyor who secures efficient scavenging and paves our streets and yards, and who minimises dust and noise in our towns, will never cease. But, so far as domestic sanitation is concerned, our anxiety as hygienists is not merely to secure dwelling-rooms instead of officially sanctioned boxes or cells, not merely to see that no dwelling, whether self-contained or a tenement, is allowed to be occupied unless it has an individual water supply and individual sanitary conveniences, and unless there is satisfactory storage accommodation for food, but also to provide arrangements for saving labour and fuel, thus rendering it easy for family life for the million to function successfully. This is the new aspect of structural hygiene ; and it comes from our increasing realisation that public health can no longer be satisfied merely with doing everything practicable to prevent disease ; it aims at a higher standard of health, and therefore concerns itself—and hereafter will concern itself more and more—with efforts to make health still healthier, and so further minimise the risk of disease. The attempt at distinction here drawn is not original, and perhaps it is more apparent than real ; for no sickness leaves a child or an adult as sound as it found him, and the prevention of disease therefore carries with it not only an increasing average prolongation of life, but also an enhamcement of average health and efficiency. This has monetary value many times greater than the expenditure on water supplies, sewerage, housing, and on the various measures of public health administration already adopted.

Past success has been especially in those departments of public health

in which the continuous purposeful co-operation of each citizen is not required, or is required only to a relatively small extent. The provision of safe water supplies and the substitution of water drainage for conservancy systems, have reduced typhoid fever to a shadow of its former self; while typhus fever has disappeared from this country—apart from occasional importations—as the result of isolation of the sick, of prevention of the movements of infection carriers, aided, it should be added, by a higher standard of personal cleanliness. The special case of small-pox is the highest possible testimony to the efficiency of our public health administration, on its detective and educational sides, assisted invaluably by the protection afforded by vaccination.

But there remain two branches of public health work, in which, although good work has already been done, most of our work is in the future. These are maternity and child welfare work, especially on the maternal side, and the particular infectious diseases which hitherto, if controlled at all, are controlled only to a very imperfect extent.

To secure the best conditions for maternity and childhood must be regarded as supremely important in public health administration. We can scarcely expend too much effort or money in this endeavour, though, at the same time, it is our bounden duty to secure full value for every penny expended. Here also we are met in our investigations and in actual work with the impossibility of separating between measures for preventing disease and for enhancing health. A chief obstacle to child welfare work is the continuance of factors injurious to the mother; and the records of causes, and local variations in extent, of mortality from complications and infections of childbearing, furnished in the Registrar General's reports, and with fuller local detail in my own special report to the Local Government Board on the subject (*Cd.* 8085) show how great is the scope for further reduction in the present serious toll on maternal health and life, and how thus we may provide the basic conditions for healthy infancy and childhood.

Next to avoidable maternal mortality and sickness the preventible causes of infantile mortality and disablement of survivors which stand out are:

> Congenital syphilis, diarrhœa, tuberculosis, whooping cough, pneumonia,

illustrations, as we need constantly to remind ourselves, of the fact that child welfare work is largely a question of prevention of infections, and that it is not self-contained, but is closely inter-twined with social work, with general sanitation, and with the work carried on in tuberculosis and anti-venereal clinics.

But although the above considerations retain their perennial importance, there is another not less important side to the endeavour to secure enhanced

national, though personal, efficiency. And one aspect of this may be summed up in the word Nutrition. The first duty of the child is to be well-nourished. Only thus can it grow and develop satisfactorily ; and it is pleasant to note the progress towards rational and away from empirical and symptomatic writing on this subject, more particularly among our American cousins. We have been habituated to mass statistics indicating the number of school children in different areas who are ill-nourished, which by themselves are no more useful or enlightening than the crude statement of any other complex which has multifarious origin, and therefore calls for more exact diagnosis and for action in diverse directions.

For practical purposes a study of causation is needed, and we then find that malnutrition is not to be met merely or chiefly by the provision of school meals—much as these may be needed in certain cases—but by a study of each child's case in conference with parents, and the giving of counsel or treatment directed to the cause of the malnutrition, whether it be merely insufficient food, or badly cooked or adjusted food, or insufficient sleep, or some morbid condition needing special treatment.

I must not be tempted to follow up this physiological side of health work, with its infinity of possibilities of enhanced health and enriched life ; but proceed to consider the main subject of my address, the general problem of the relative spheres of utility of Compulsion and Education in Public Health Work.

The general problem of the relative spheres of compulsion and education has important bearing on every branch of work for the amelioration of human welfare. The social history of the nineteenth century consists very largely of a steady extension of the enforcement of compulsory duties and restrictions in various aspects of communal life. Each of these duties and limitations has been made obligatory by Parliament as the result of public agitation, directed to the support of the weak against the strong, the defence of the exploited against the exploiter, of the purchaser against the vendor, of children against negligent parents, or of the careful against the careless parent. I need only mention Poor-law enactments, enforcing contributions from all in support of the destitute, the various factory and mining Acts providing against accident and overwork, especially of women and children, and the compulsory provisions relating to infectious diseases, to sanitary defects, to food frauds, and so on.

Ignorance being a communal peril, compulsory elementary education has been universally enforced. The parent is no longer free absolutely to control the education of his child ; and taxpayers and ratepayers are constrained to pay for the education of other people's children. The nexus of restriction and regulation has extended in all directions ; and the diminution of personal

liberty thus produced is not only justified but necessitated by communal life. Each restriction has, in fact, been called into being to defend the liberty of the weak against oppression and injury, to diminish the inevitable and unnecessary burdens on the common purse which are associated with unrestrained licence, and to aid normal progress in health and civilisation.

In the prevention of disease compulsory measures bulk largely, their success depending almost entirely on the extent to which they carry with them the convictions of the vast majority of the population. They may thus be said to be effective inversely to the extent to which compulsion is needed. Compulsory vaccination against smallpox is the most striking instance of this general rule. This almost unique safeguard against infection is, in substance, only enforceable by consent, though this consent may sometimes be unwilling ; and in practice compulsion is limited by exemption on the ground of conscientious objection. The segregation of cases of acute infectious disease now causes no difficulty. It has become realised that compulsion for this purpose confers a privilege, and it is when this is realised that a compulsory measure becomes universally effective.

In the above cases the necessary measures, as, for instance, for enforcing segregation, are strictly limited in time, and for this reason, among others, they are enforceable. But when dealing with chronic infective diseases like tuberculosis and syphilis, we enter into another sphere, in which the practicability of any form of compulsion is necessarily limited by the logic of facts. These cases, therefore, deserve special study.

Compulsion in Tuberculosis.

In tuberculosis the necessity for controlling infectivity by compulsory means arises chiefly when a patient, for instance a vagrant continues to indulge in indiscriminate expectoration in circumstances of crowding, notwithstanding advice to the contrary ; and a number of towns possess, and on rare occasions use, powers to secure hospital treatment of such cases. There is general testimony that the possession of these powers is useful as a deterrent to culpable carelessness, and in securing the removal of a patient occupying a crowded room.

But is this compulsory power more than a minor desideratum in the control of tuberculosis ? I am not concerned to debate the attempts made from time to time to undermine our appreciation of the value of the official programme for the control of tuberculosis in this country. But, for most of us, our belief in the possibility of greatly reducing this disease, if known measures of control are exercised on an adequate scale in every sanitary area, remains unshaken, and it is one of the disappointments of recent years that inertia and apathy have so often persisted in place of faith and strenuous

effort. The official duty of the medical officer of health is to combat this disease by investigation of sources of infection, and by measures calculated to diminish the spread of infection and to remove the factors favouring infection, whether domestic, social, or industrial. A first step towards adequate action is the prompt notification of recognised cases to the medical officer of health as soon as they are recognised. It is notorious that in a high proportion of total cases this is not secured from the medical practitioner, and this is especially true for non-pulmonary tuberculosis. In part owing to this cause, in part owing to failure to seek medical advice, and in part from inertia on the local executive side,* a large share of our anti-tuberculosis work has been belated and very partial. I do not doubt the occasional value of the compulsory powers for the segregation of the careless tuberculous sick ; but a more rigid enforcement of the regulations for prompt notification would be even more valuable ; for compulsion in this direction has definite educational value, besides opening up the way for administrative action. A judiciously arranged appearance in a police court may be made a useful means of cultivating a hygienic conscience ; but with increasing sense of communal duty on the part of all concerned this *via dolorosa* to the ideal should seldom be necessary. General co-operation between patient, private doctor, and health officer would imply a standard of moral education in all concerned which would bring us nearer our desired goal than any action based on compulsion, however necessary in the immediate future compulsion may continue to be, for the good it achieves, and still more as a means for rendering future compulsion unnecessary.

Before considering the somewhat analogous case of syphilis we may linger for a moment over the problems involved in

COMPULSION AND THE PREVENTION OF ALCOHOLISM.

This, for several generations, has been a problem in which the legislature has not hesitated to intervene, presumably, in every instance, on the initiation of preponderant public opinion. As I have elsewhere stated†, the history of the United Kingdom is studded with attempts to control the liquor trade, and to put it in shackles, such as have been found unnecessary for any other industry, except that of prostitution. The necessity for restrictions on the sale of alcoholic drinks is admitted by all, the only difference of opinion being concerned with the extent and details of these restrictions.

Alcoholic indulgence, though diminishing, remains one of the greatest enemies of the public health ; and it is well that in the annual reports of an

* Other factors concerned are divided responsibility between county and local sanitary authorities and between medical officers of health and tuberculosis officers.

† Prohibition in America and its Relation to the Problem of Public Control of Personal Conduct, by A. Newsholme. (P. S. King & Son. 1921.)

increasing number of medical officers of health it is the subject of comment and advice. Alcohol is a great creator of avoidable poverty. It very commonly makes the bed for tuberculosis, and not infrequently is the final element in lowering the resistance to the promiscuity which is the social cause of syphilis and gonorrhœa. It swells the ranks of fatherless children and of neglected infants ; it helps to fill our prisons and our hospitals. It is a source of immense waste of national wealth. Approximately, as a nation we spend every week nearly as much on alcoholic drinks as is spent in a year on the chief branches of public health work.

Whether in this country we follow the example of the United States and of a large part of Canada which have " gone dry "—and which so far as the vast majority of the people are concerned are making this policy effective— or whether we pursue the more gradual process of increasingly stringent regulation of the sale of alcoholic drinks, allowing experiments in local option to be made in every small or large community which desires them, there can be no doubt that we are, as public health representatives, intimately concerned in the diminution of the consumption of alcoholic drinks, extending, if the mass of the people persistently desire it, to absolute prohibition. By this means the possibilities of increased industrial efficiency, of decrease of accidents, of successful work in housing reform, of greater care of maternity and childhood, of the diminution of tuberculosis and venereal disease, and of crime and insanity, will be enhanced ; and, this being so, no public health worker is likely to fear compulsion judiciously applied. That in America compulsion, to the extent of prohibition, represents the result of a steady growth of public opinion over several generations, that it embodies the persistent opinion of a large majority of the American population, and that it will therefore continue to be enforced, and with increasing efficiency, no one who like myself, has carefully studied all the facts of the case can doubt. Compulsion in this country must similarly fulfil the condition that it represents preponderant public opinion, and especially of public health opinion, and to the extent it does so the path of public health reform in relation to the trade in alcoholic drinks will become much easier.

Compulsion and Syphilis.

For simplicity of argument, I omit gonorrhœa from the scope of my remarks, as it is unlikely that success will attend efforts to secure compulsorily either the notification or the continuance of treatment of more than a minority of cases of this disease long enough to be able to affirm that gonococcal infection has ceased.* The last-named difficulty arises in regard to syphilis,

* Memorandum V. 21 of the Ministry of Health gives admirable rules as to conditions which justify a gonorrhœal patient being discharged " after completion of treatment and observation." These are unlikely to be able to be fulfilled in most instances in private practice ; and they imply a high standard of co-operation between patient and medical officer, which will often not be attained in V.D. treatment centres.

and will need careful consideration in the discussion which we are to have in this section.

General Principles justifying Compulsion.

What are the general principles justifying compulsion in public health or social work? They include the consideration that the end aimed at by compulsion is very important for the public welfare, that it cannot be achieved to an equal extent or within a reasonable time by educational measures, not including compulsion, that the compulsion can be enforced, and that it is endorsed by a majority of the community.

For syphilis compulsion is being advocated to secure notification of each case to the medical officer of health, and to enable continuance in treatment until the patient is freed from infection. Complete control over the disease might theoretically be gained (*a*) by ascertaining, so far as practicable, the source of infection in each case, in order, when practicable, to prevent its continuance, and (*b*) by advice and action in respect of each notified case, which may prevent the continuance of infection from this case.

The Scope of Present Legislation against Syphilis in England.

In view of the obvious difficulties under (*a*) the most practicable measure for the prevention of further spread of syphilis is the successful and complete treatment of each case; and were this not a special subject of discussion in this section, comment on it would naturally be made at this point. In view of later discussion I content myself with reminding you that venereal diseases in this country have been the subject of unique national legislation, making it an offence for any person other than a legally qualified medical practitioner to treat these diseases. Legislation to this effect was secured at an early stage after the launching of the subsidised schemes for the diagnosis and treatment of venereal diseases, and for educational propaganda regarding them. No such legislation is imposed as to the treatment of any other disease, and it was only conferred in this instance on the urgent representation of the Local Government Board to Parliament that without this power the newly established venereal disease clinics could not be assured of results commensurate with the expenditure incurred and with the national needs. If this law is enforced, the venereal patient must choose between no treatment and medical treatment, unqualified treatment carrying with it serious penalties. There ought, in my view, to be another clause rendering it obligatory on any person suspecting that he is suffering from venereal disease to have resort to medical advice. This will become still more desirable if further action is to be taken to ensure continuance in treatment until the patient is free from infection. The enactment forbidding treatment other

than medical could never have been obtained had not free treatment been available for all comers, and the above indicated addition would be equitable, though its enforcement or the infliction of a penalty for non-compliance would be practicable only exceptionally. There appears to be some ignorance of the existence of the above-named enactment, and to be too little effort at its enforcement. In view of the fact that successful treatment is our chief public means for minimising infection, energetic searching out of breaches of this law should surely form an important part of our police and public health work against venereal diseases.

The Difficulties from Discontinued Treatment.

It is well known that many patients discontinue treatment on the cessation of superficial symptoms. I would deprecate the exaggeration which unduly decries the value of anti-venereal clinics, because of this unfortunate fact. In a large proportion of cases cure with cessation of infectivity is secured, and perseverance in present measures and their extension justify us in expecting actual diminution of venereal diseases, of which there are already indications. Even when infectivity has not been permanently abolished, it has often been temporarily removed; and, assuming that the doctor, who should have the co-operation of a confidential social worker, has done his duty, each patient has been instructed in the natural history and dangers of his disease; and if he sins in neglecting continued treatment, he does so, not ignorantly, but against light and knowledge.

In advocating compulsory notification of syphilis we need to bear in mind the objects, already indicated, for which such notification could be utilised. If merely moral suasion to secure complete treatment is desired, this is already secured for every patient medically treated—or at least to an extent which would not be increased by notification, under present conditions of treatment, as patients not under medical treatment will not be notified. If the enforcement of continued treatment of defaulters is the object, it will be remembered that probably more than half the total amount of medically treated venereal disease in the community is treated at the public expense; that it is consistent with the confidential nature of this treatment to use vigorous efforts, short of compulsion, to persuade patients to return for treatment; and an important point for discussion is whether attempts to enforce compulsory continuance of treatment of syphilis will be likely to secure the treatment of as many patients as are now treated. In other words, will the more prolonged treatment of a certain proportion of patients expected to be secured by compulsion compensate for the conceivable loss due to patients refraining from attending publicly supported clinics?

I refer in particular to the possible transfer of patients from official clinics to private medical practitioners because—in the light of our experience

with tuberculosis, in which furthermore no question of morality is involved—it is unlikely that private practitioners will generally notify the fact that patients, before completion of treatment and cessation of infection, have discontinued attendance on them. Who is to state when infection has ceased? Medical opinion differs widely as to the length and character of the required treatment, and unsatisfactory certificates of freedom from infection will be given. Long intervals occur in legitimate treatment; are we to expect each practitioner to keep a card index and notify the non-appearance of his patient after a prescribed interval? What about the conscientious objector to arsenical or mercurial treatment who will soon appear? Will not the introduction of the principle of enforced continued treatment lead to an agitation not unlikely to culminate in the repeal of the Venereal Diseases Act, with its limitation of treatment to medical practitioners?

When considering the advisability of enforced notification of syphilis, it must also be borne in mind that a mass of very incompletely utilised information is possessed by the physicians of venereal disease clinics, and by physicians in other clinics.

USE OF INFORMATION AT PRESENT AVAILABLE.

A large number of women and of young children attend general and special hospitals when suffering from syphilis, interstitial keratitis, &c., and, if the needed staffs were supplied, such cases might without offence, in many instances, be made the means of ridding families of syphilitic infection. The same remark applies to the notifications of stillbirths (after the seventh month) made by doctors, and to the notifications of stillbirths (without any limitation as to period of frequency) made by midwives. Possibly 20 per cent. of these are due to syphilis. It will be interesting to learn whether in any area these means to valuable anti-venereal work have been utilised fully, or whether in most areas they have not been almost completely neglected.

I have not dwelt on these existent but neglected possibilities of anti-venereal work to deprecate, when it becomes expedient, the adoption of compulsory notification of syphilis, preferably first locally, in accordance with our British method of local experimentation, or partially as by rendering infantile and inherited syphilis notifiable, future extensions of notification keeping pace with extension of administrative activity. But I do urge that present openings for valuable anti-venereal work should be exploited, if only as a means of testing the practicability of more general action.

The desirability of compulsory notification of cases of syphilis will become much more evident if we regard the tracing of sources of infection as within the range of practical administration; and it may be in this direction, more

than in the enforcement of return for completion of treatment of individual cases, that possibilities of useful action will emerge. In tuberculosis, owing to its long latency, to the delay before diagnosis is made, and to the multiple possibilities of infection, investigation of individual sources is most difficult, and in dealing with this disease we have generally to content ourselves with action based on our general knowledge of sources of infection and of the conditions which render infection potent. But in syphilis, when judicious inquiry is made, it is sometimes possible to discover a common source of infection for several cases, and this may point to the location of prostitutes and action against these. Of course, this can be interpreted as one-sided action, bearing unfairly on women, though some American attempts on these lines appear to show that fairly impartial action may be taken against men and women.

Control of Venereal Disease in U.S.A.

The standard form of law for the control of venereal diseases in the United States comprises the following clauses, which have been approved by the U.S. Interdepartmental Social Hygiene Board.

Section 3.—State, county, and municipal health officers, or their authorised deputies, within their respective jurisdictions are hereby directed and empowered, when in their judgment it is necessary to protect the public health, to make examinations of persons reasonably suspected of being infected with venereal disease, and to detain such persons until the results of such examinations are known ; to require persons infected with venereal disease to report for treatment to a reputable physician and continue treatment until cured, or to submit to treatment provided at public expense until cured ; and also, when in their judgment it is necessary to protect the public health, to isolate or quarantine persons infected with venereal disease. It shall be the duty of all local and state health officers to investigate sources of infection of venereal disease, to co-operate with the proper officials whose duty it is to enforce laws directed against prostitution, and otherwise to use every proper means for the repression of prostitution.

Section 4.—All persons who shall be confined or imprisoned in any state, county, or city prison in the state shall be examined for and, if infected, treated for venereal diseases by the health authorities or their deputies.

As illustrating the current activities in the State of Pennsylvania, the following extracts from Mrs. J. L. Boyd's report to the Laywomen's Division of the Social Hygiene Congress, held in Pittsburg, February, 1922, may be given :—

> " The State finds, however, that it cannot stop with the clinics ; the sources of infection must be located. A system for this purpose is in force in the larger centres of population. The source is usually

found to be in a house of prostitution. The system also endeavours to locate clandestine and segregated prostitutes."

"The information concerning the location of prostitutes may be obtained through the clinics, from individuals, from special committees, or from the police. When a house of a prostitute is located the procedure is somewhat as follows—

"A police raid is made upon a house, all the inmates taken are brought before a magistrate. All are examined to determine whether or not there is evidence of a transmissible disease. The men who show no signs or symptoms are allowed to go, but are requested to report to the clinic at fixed intervals until the period of incubation of the disease is passed. The women are quarantined to await examination for infections, feeble-mindedness, &c. This examination determines whether they are to be kept in quarantine houses or detention homes established by the Department of Health, or whether they are to be placed in institutions for feeble-minded. In Pennsylvania, thirty-three detention homes have been established to accommodate the women removed from the streets and houses of prostitution during their examination and treatment."

"The most baffling situation in these drives against prostitution and venereal disease is the difficulty of locating the prostitute, especially the clandestine prostitute."

This scheme of action includes careful inquiry from patients to ascertain, when possible, the source of infection, police aid in the location of prostitutes, the power to arrest men and women in a raided house of bad repute, and the power to detain and examine infected and suspected men and women, as well as an obligation of patients to be treated. In the above scheme prostitution is treated like an infectious disease, a justifiable basis of action. But the operation of such a scheme against men is almost necessarily more limited than against women ; and it is doubtful whether a large measure of success can be secured by it. Attempts to secure compulsory examination of suspected persons in this country would be "up against" strong sentiment, which has had an important and beneficent history in humanising and moralising our views as to the prevention of venereal diseases ; and, in short, I do not regard action on these lines as practicable or even desirable under present circumstances in this country, except in the direction of punishment of all persons frequenting a house of bad repute, irrespective of their condition as to infection.

Compulsory Segregation.

Action to minimise risk of spread of infection, compulsory when necessary, is taken systematically for acute infectious diseases ; and similar action has

been found practicable for certain cases of tuberculosis. Can it be applied effectively for syphilis? It would appear at first sight that persons imprisoned for crime and found to be suffering from venereal disease might legitimately be detained until free from infection, even though this meant longer detention than the term of legal imprisonment; but a study of the Report of the Royal Commission on Venereal Diseases (par. 178 *et seq.*) and of the evidence given before that Commission shows the difficulties in equity involved in the suggestion. In other countries such powers are stated to have been partially employed, as well as the power of compulsory examination of prisoners when suspected to be suffering from venereal disease. Experience of the use of these powers will be watched with interest tinctured with critical doubt. The Royal Commission recommended the compulsory detention of infectious venereal patients who had resorted to Poor-law infirmaries, but no practical action has been taken on these lines. This fact alone illustrates the difficulties associated with compulsory action in this terribly destructive but tantalisingly chronic disease.

The Prevention of Promiscuity.

After all, in asking for compulsory information as to cases of syphilis while failing to utilise a large share of the information we already possess, and in asking for powers of compulsory detention or treatment, or both, are we not unduly restricting our outlook on the problem of the prevention of this disease? For practical purposes it may be said that syphilis is spread only by means of promiscuous sex relationships. By promiscuity I mean the more or less casual relationships between men and prostitutes, or between men and so-called "amateurs." In the absence of promiscuity, syphilis would rapidly diminish, if not disappear, and with it would go a chief cause of premature old age and mortality. Syphilis and gonorrhœa are communicated almost exclusively by sexually immoral persons; and in the absence of promiscuity on the part of healthy persons infection would cease to spread. Promiscuity thus is essentially an insanitary act. From this point of view Dr. Helen Wilson's contention is sound. As I understand it, it is to the effect that the person who voluntarily exposes himself or herself knowingly, or through negligence to the danger of becoming infected, commits an offence against the public health which is only less than that of the associate who, knowing that he or she is infectious, runs the risk of communicating disease to another.

I know full well the weight of the contention that prostitution always has been and always will continue. That depends on public opinion, which has worked miracles in changing moral habits in other directions, and on public policy, which can be so directed as to reduce prostitution very greatly, and to

make early marriages easier and more general. It depends also on the degree of success of the educational propaganda which forms an essential part of every official venereal disease scheme, and on the wisdom with which this educational work is conducted. But it depends more than on these: on the building up of national character, on a change in the ideals of the mass of the people which will make it "bad form" to be sexually loose, will gradually establish an equal standard of sexual morality for the two sexes, and will change and extend our national system of education, so that it will no longer be in the main intellectual, but will train the emotions of youth, will cultivate right habits and thus educate the powers of inhibition before the hour of temptation to promiscuity arrives, and will thus ensure in future generations greater sanctity for family life and a deeper sense of responsibility for the health of partner and children.

With the growth of such ideals the necessity for compulsion in public work or in other aspects of life will wane. I do not say that meanwhile compulsion has no rôle to play. Compulsion to the extent of entire prohibition of alcoholic drinks is being tried in America, and it will, I believe, succeed, notwithstanding formidable difficulties. It is justified by the freedom from the thraldom of alcoholism which it is securing for many thousands of men and women whose will power had gone; and the voluntary sacrifice made by the majority of their freedom to indulge in a pleasant habit of minor narcotism, as well as the unwilling sacrifice of this freedom by a minority of the people, is a small price to pay for the diminished crime and disease, the lessened destitution, the increased industrial efficiency, the immense enhancement of national wealth and welfare which are being secured by prohibition.

If any practicable form of compulsion for the diminution of venereal infection can be applied which acts impartially on all concerned—including the healthy person indulging in promiscuous sexual relations, as being inimical to civilised life—then let us try it. I put aside the general teaching of chemical prophylaxis. It can only be effective in a fraction of cases; furthermore, non-personal and indiscriminate instruction of this kind will, in my view, increase the amount of promiscuity, which is the real enemy to be fought.

THE ISSUES INVOLVED IN THE PROBLEM.

We must not lose our view of the final issues involved. To be successful, civilised life in communities necessitates a steady, though it may be slow, change and advance in the standards of morality. It necessarily involves partial suppression of our over-sexed instincts and a stricter adherence to the monogamy which civilised family life implies. To affirm that no progress in this direction has hitherto been made is to state a dubious proposition, and partial failure in the past does not condemn to futility psychologically

better directed and more intelligent efforts now within our reach. It would be beyond the scope of this address to attempt to adumbrate the possibilities of improved ethical training, based largely on the important additions to our knowledge of psychology made in recent years. This is more properly the task of the pedagogue inspired by high ideals and by an accurate knowledge of child psychology, and of parents who realise the extent of their responsibility and of their power to educate their children to resist venereal or any other form of moral infection.

Our knowledge of the processes by which habits of self-control can be initiated and fortified, and by which the social instinct can be made to restrain and in large measure to sublimate the sex-instinct—as well as of the possibilities of forming and directing public opinion towards higher ideals—goes far to confirm the opinion that the victory over venereal diseases will be gained chiefly on the ethical plane, and that on this plane we can—possibly earlier than appears likely—achieve success. Although moral progress is slow and gradual, the rate of progress tends to become accelerated at each step, so that in the end vast masses accept a new truth in a short time.

These remarks have important bearing on the relative utility of education and compulsion. By education, obviously, I do not mean the intellectual instruction which so far has been the main result of national educational effort, but the systematisation, from the earliest age of each child, of efforts in the training of character and the development of self-control through example and training. Knowledge is necessary, but in practical life it is attitude more than knowledge that counts. The real failure in life consists in the shirking of the discipline of self-control. The exercise of compulsion runs some risk of atrophying self-control ; but it may be a means of training in self-control when it operates chiefly against those who cannot or will not exercise will-power. Indeed, the two ideals of compulsion and of education of character are not irreconcilable in public health work. In the sequence of national life the policeman preceded the school-teacher, but the success of the teacher will render the policeman less and less necessary if intelligent and conscientious parents enter into co-partnership in the task of education of character.

One word of warning is needed in conclusion. Compulsion in respect of venereal diseases must be in a form which can be applied fairly and equally against all offenders, including those guilty of the insanitary and anti-social act of promiscuity ; and in any attempt at compulsion officially applied we must, above all, avoid the risk of dividing the army of fighters for health into camps warring against each other instead of against the common enemy.

THE ROYAL SANITARY INSTITUTE.

FOUNDED 1876.

REVIEWS OF BOOKS.

SEWERAGE AND SEWAGE TREATMENT.*

The Author of this work is Assistant Professor of Municipal and Sanitary Engineering at the University of Illinois ; and the book itself is a development of his classroom and lecture notes. It covers the whole field of the collection and disposal of sewage, every branch of the subject being fully dealt with.

Mr. Babbitt does not confine himself to the design and construction of works, but deals also with such incidental questions as the various methods of raising money for public works, the drawing up and letting of contracts, and cost keeping. His book is, in fact, an encyclopædia on sewerage and sewage treatment, dealing, not only with the work itself, but with every appliance and accessory required for its execution. Thus various forms of pumping machinery, mechanical excavators, trench pumps, timbering and explosives are described, and their advantages and disadvantages pointed out.

More use is made of formulæ and diagrams than is usual in this country. Among other questions which are critically examined are those of rate of increase of population, run-off in relation to rainfall, stresses in the pipe-ring, and the velocity of settlement of solid particles as affected by their size.

The organisation and modes of execution of sewerage work are described in detail, even to the enumeration of the tools required for the different kinds of work. Details of cost are also given.

It will be interesting to English readers to learn that excavation by hand is only resorted to on small jobs, and that, "in a general way," a bricklayer building a sewer will lay 300 bricks per hour.

A chapter is devoted to the maintenance and protection of sewers. The question of explosions is touched upon, special reference being made to two violent and destructive explosions which took place at Pittsburgh in 1913 and 1916. On each occasion some two miles of street were ripped up and damage was done to the amount of from $300,000 to $500,000. The principal causes of explosion are said to be gasoline (petrol), illuminating gas, Calcium carbide, and waste naphtha from cleaning establishments.

More than two-thirds of the book is devoted to sewerage, and the remainder to sewage treatment, the various modes of disposal now in use being briefly and clearly described.

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* SEWERAGE AND SEWAGE TREATMENT, by Harold E. Babbitt, M.S. 8vo., 531 pp., illustrated. 1922. New York and London. Chapman & Hall, Ltd. Price 25s.

The author confines himself almost exclusively to American practice. Thus the rotary distributors so commonly used on this side of the Atlantic in connection with trickling filters are dismissed in a couple of lines. The fall required for such a filter is stated as from 12 to 15 feet, of which about one-half represents the depth of the bed and the other the head absorbed by the sprinklers.

The treatment of sewage on land also receives scant notice ; and the term " broad irrigation " is applied to a process of percolation, more nearly resembling what is known in this country as " land filtration."

The chapter on Activated Sludge deals chiefly with American work in this field. Mr. Babbitt quotes a comparative estimate by Eddy showing the total cost of treatment by the Activated Sludge process as 36 per cent. greater than by Imhoff tanks and sprinkling filters. His statement that the use of mechanical agitators has been attempted " with indifferent success " hardly does justice to the results which this method has yielded at Sheffield.

Disposal by dilution also occupies a chapter. With less than 2 cubic feet of diluting water per second per 1,000 of population failure may be expected. With 8 second-feet or more success is practically assured. Between these limits the results are uncertain.

Mr. Babbitt's book is not a mere recital of methods, but sets forth clearly and fairly the considerations on which they are based. It is well arranged and lucidly written, and illustrated by no fewer than 186 drawings and photographs. Though primarily intended for the use of students, it will be valuable as a work of reference to all who are concerned with sewerage and sewage disposal.

A. J. M.

The Pin-Line Method of Setting up Sight Rails.*

One of the most important details in sewer construction is the setting-up of the sight rails, for on their accuracy depends the true calculated discharge of the sewers, and the gradients shown upon the sections, also the true picking up of existing or proposed sewers, and the avoidance or passing correctly above or below any culverts, sewers or water mains that may cross the line of the proposed new work. This small brochure has, for its object, the explanation of a system of driving iron pins, flush with the road or other surface at the sight rail stations, to give fixed level values as long as required. The advantages are that it saves the operation of setting up the level and starting at distant bench marks every time a sight rail is required. Should the sight rails get disturbed or knocked down, they can be checked or refixed without any difficulty, and without relevelling, as the pins will remain as fixed values. A special form of level book called " Sight Rails Record " accompanies the instructions which are so simple that anyone who can use a level can adopt this system without difficulty.

H. A.

* A Treatise on Sight Rails and Sight Rails Record, by Maurice S. Excell, A.M.I.M. & C.E. 8vo., 14 and 46 pp. 1919. M. S. Excell.

The Chemical Examination of Water, Sewage, Foods and Other Substances.*

That this number of the Cambridge Public Health series has reached a second edition, is some evidence that it has met a public demand, though it is difficult to see in what way it has superior claims to attention to many similar works. It is primarily intended for the use of students who are doing laboratory work for degrees and diplomas in Public Health, but, unhappily, it attempts to go much beyond their requirements. As a consequence it is sketchy in its descriptions of processes, though it has the saving grace of referring in the text to the sources of many of the processes.

In this edition, the chapters on milk and water have been expanded, and a chapter has been added containing an outline of elementary toxicological analysis. As this extends only to ten pages, it is difficult to see, how in practice it can possess any real value.

A. B. H.

Public Health Chemical Analysis.†

The information contained in this work is reliable and clearly expressed, and it cannot fail to prove useful to students of hygiene. But for such students the treatment of the subject occasionally lacks proportion (more pages, for instance, are devoted to the properties of sugar and sugar products than to the subject of milk), and in places the directions given to the student are hardly explanatory enough for those who have but little knowledge of chemical procedure.

A Graphical Cost Analysis of Cottage-Building.‡

This brochure consists of a short description and eighteen diagrams showing various charts of labour and materials principally connected with cottage building under the Government Housing Scheme. The letterpress fully explains each chart, and undoubtedly these should form a very essential part of the library of every Architect engaged on such Housing Schemes.

They would also form an extremely useful basis for any Architect or Surveyor engaged in similar work, as the time necessary for work in the several trades required in house building is shown on the charts in conjunction with the approximate total cost of the property, whilst other charts indicate the number of men and the time they would be required in erecting certain buildings.

Whilst the actual charts may lose some of their value when the present housing schemes are completed, the basis upon which they are designed will

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* The Chemical Examination of Water, Sewage Foods and Other Substances, by J. E. Purvis, M.A., and T. R. Hodgson, M.A. 8vo., 346 pp. Cambridge, 1922. University Press. Price 20s.

† Public Health Chemical Analysis, by Robert C. Frederick and Aquilla Forster, Ph.D., M.Sc., A.I.C. 8vo., 305 pp., illustrated. London, 1920. Constable & Co., Ltd. Price, 21s.

‡ A Graphical Cost Analysis of Cottage-Building, by W. H. Wainwright, A.M.Inst.C.E., A.M.I.Mech.E. 8vo., 8 pp., 18 diagrams. London, 1922. H.M. Stationery Office, Kingsway and Abingdon Street, S.W. Price, 2s. 6d.

be standardised and can be applied to any class of property, and not be limited to cottage building.

There are also charts indicating the ratio of cost per superficial foot and cubical contents.

The only criticism one would suggest is in regard to the diagram giving the weight of material used, the details of the weight of such materials as plaster, wood, &c., being useless for ordinary purposes.

The comparative curves showing variations in prices and materials and rates of labour are most useful, and the brochure is one which any Architect or Sanitary Engineer would do well to study.

E. W.

Influenza : Essays by Several Authors.*

If our knowledge of Influenza were commensurate with the amount of ink spilt in discussing its history, progress, clinical characters, pathology and causation, we ought ere this to be able to claim this most terrible plague as within the range of preventive medicine. But, alas ! we are almost as helpless in its grip as our forefathers were, and it would appear that some hitherto undiscovered line of action must be discovered before its ravages can be stayed.

The present volume is a wholesome reminder of the present chaos, and an attempt towards solving it by suggesting that a number of diseases masquerading under different names are in reality Influenza, and that there is one enemy rather than many. This conception is advanced seriously as opening up the possibility, as suggested by Dr. Crookshank, that "if we profit by experience . . . . we shall be able to forecast the coming storm when first appears on the horizon a cloud no bigger than a man's hand." Thus poliomyelitis, encephalitis lethargica, epidemic pneumonia, may be manifestations of what Dr. Hamer believes to be outbreaks which, though of a specialised type, "are yet not to be distinguished by any specific character from what we call true influenza." Presumably we are to regard outbreaks of these diseases as warnings of an outbreak of true influenza, although it must be known to all that such diseases may occur unassociated with epidemic influenza. We fear that this means of forecasting will not be efficient. Nor can we regard the common association of epidemics of Heine—Medin disease, whether of typical or atypical attacks, as evidence of their causal identity with influenza. That Sydenham's conception of an "epidemic constitution" is correct, which means, in this case, excessive prevalence of influenza in the world for several years, there can be no doubt. We are, unfortunately, little nearer than, in his time, to accurate knowledge of the factors, whether telluric or other, producing this intermittent pandemicity. But it is more consistent with modern knowledge of disease to assume that the factors disguised from us under the name of "epidemic constitution," are equally favourable, both to encephalitis lethargica and to influenza, than to hold that the causal organisms of these diseases are identical.

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* Influenza : Essays by several Authors, edited by F. G. Crookshank, M.D., F.R.C.P., 8vo., 528 pp. 1922. London. William Heinemann. Price 30s.

In the above remarks we have attempted to give some idea of the general thesis of this work. The whole volume deserves careful study. Dr. Crookshank writes clearly, and his articles on "Method and Thought" and on "the first principles of epidemiology" give distinction to the volume. Nor can one afford to miss reading Dr. Hamer's characteristic and occasionally witty article on "the phases of influenza." Other articles deal with various aspects of the symptomatology of influenza and need not detain us. Dr. R. Donaldson contributes a most exhaustive chapter of 175 pages on the bacteriology of influenza, reference to which will save other writers a mass of research.

A. N.

Merchant Seamen: Their Diseases and their Welfare Needs.*

This book is an interesting and sympathetic account of the condition of merchant seamen, with reference to their health and welfare. It shews the difficulty of providing adequate accommodation for the crew, without curtailment of cargo space. Such curtailment, if confined to British ships, would put their owners at a great disadvantage to foreign shipowners where standard accommodation for the crew might be less generous. It may be hoped, however, that the introduction of oil fuel may give more room for cargo, and the turbine instead of the old reciprocating engines, also takes much less space.

The need of stewards for the crew, and the desirability of a certified cook, are subjects dealt with by the Author, and are certainly worthy of consideration. Tables are given, shewing the causes of death in the merchant service for the years 1913—1914, and then for the Army and Navy, in which it is regrettable to see the preponderance of deaths from alcohol and injuries in the merchant service compared with those in the Army and Navy.

The Author makes special reference to the interest taken in the subject of the welfare of the men, by The Royal Sanitary Institute, and to the papers read and discussed at their meetings.

H. P. B.

Vitamins and the Choice of Food.†

Vitamins, or the so-called accessory food-factors, are bodies of unknown constitution, which have never been separated from the foods containing them, and which are, therefore, known by their effects only, and chiefly by the effects produced upon health, when absent from or deficient in a dietary. Modern research and experiment have revealed that there are 3 vitamins in food which have different physiological properties, and produce different kinds of ill-health or disease when deficient or absent in food. The fat-soluble A. Vitamin, as its name implies, is contained chiefly in animal fats

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* Merchant Seamen: their Diseases and their Welfare Needs, by W. E. Home, O.B.E., B.Sc., M.D., D.P.H., F.R.San.I. 8vo., 111 pp. London, 1922. John Murray. Price 5s.

† Vitamins and the Choice of Food, by Violet G. Plimmer and R. H. A. Plimmer, D.Sc. 8vo., 166 pp., illustrated. London, 1922. Longmans, Green & Co. Price 7s. 6d.

(cod liver oil, butter, egg-yolk, etc.), but also in raw cabbage, lettuce and spinach. This vitamin is very essential for young growing animals, as it is concerned in the growth of bone, teeth, and other tissues. Absence or deficiency of Vitamin A. tends to produce rickets in young children and young animals. The milk of grass-fed cows contains this Vitamin, as the green parts of plants are rich in it ; but the milk of stall-fed cows (fed on roots, oil-cake and brewers' grains) is very liable to be deficient in it. This Vitamin, in foods containing it, is destroyed by long heating, and by oxidation. Young children should have fresh grass-fed milk, and some butter, eggs, and green vegetables as a daily part of the diet after one year of age. Margarines made from vegetable oils, lard, and olive or salad oils contain no vitamins. The best antidote for rickets is cod-liver oil, not too finely refined.

Water-soluble B. Vitamin is contained in the yolk of eggs, the germ of wheat, yeast (marmite), liver and sweetbreads, fish-roes, and some nuts. Its absence or deficiency in a diet produces the disease known as Beri-Beri—which has been observed in Eastern races amongst those who live on polished or decorticated rice, the B. Vitamin being present in the husk but not in the body of the rice grain. Water-soluble C. Vitamin is present in vegetables and fruit juices when eaten fresh (lemons, oranges, tomatoes, swedes, cabbage, salad vegetables, etc.). Its absence or deficiency in a diet produces scurvy. Tinned meats, meat extracts, and preserved or bottled fruits and dried vegetables contain none of this Vitamin, and will inevitably produce scurvy if relied upon solely as foods on ships on long voyages or on arctic expeditions.

Doctor and Miss Plimmer have succeeded in producing a most valuable and interesting book on Vitamins, which should be read by all interested in foods and diets, and especially by the Medical Officers of the Maternity and Child Welfare centres now working so successfully in all parts of the country. The book contains an extremely useful appendix showing the distribution of the three Vitamins in the various foods commonly consumed.

L. C. P.

Cookery.*

Taken as a fine art, as the little manual points out, cooking is an occupation making all the demands of any dainty handicraft.

It requires intelligence to plan and devise; strength and skill for its manipulation ; keen appreciation of the tastes of individuals and sympathy with their preferences ; and a love of the work for its own intrinsic value.

Miss Gordon gives the Hygiene of Food and its Cooking in her Chapter on Proteins, Carbohydrates and Fats, and suggestions for menu making. The book is full of practical advice as to how to carry them out in refined middle-class homes which, to-day, form the great majority of the national life.

I. W. W.

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* Cookery, by Mary Duke Gordon and Eleanour Sinclair Rohde. 8vo., 248 pp. 1922, London. Longmans, Green & Co. Price 6s.

MEETINGS HELD.

CONGRESS AT BOURNEMOUTH.

The Thirty-Third Congress of the Institute was held in Bournemouth from July 24th to 29th, 1922, under the Presidency of Major-General the Right Hon. J. E. B. Seely, C.B., C.M.G., P.C., D.S.O., M.P., Lord Lieutenant of Hampshire.

Excellent accommodation was provided for the meetings in the Municipal College and the Town Hall, and the very thorough arrangements made for the reception and convenience of Members and Delegates were much appreciated by those attending.

On Sunday, July 23rd, a Special Service was held at St. Peter's, the Parish Church, the sermon being given by the Right Rev. the Lord Bishop of Birmingham. The Service was attended by the Mayor and Town Council and many members and Delegates.

The first General Meeting took place on Monday, July 24th, when Major-General the Right Hon. J. E. B. Seely was installed as President, and delivered his Inaugural Address.

The Popular Lecture on " Clean Air " was delivered by Prof. Leonard Hill, M.B., F.R.S.

The Right Hon. the Lord Mayor of London and the Lady Mayoress honoured the Institute by attending the Congress and taking part in the proceedings, and also by visiting the Exhibition.

The business of the Congress was divided into five Sections and six Conferences (particulars of which were given in the Supplement to the last issue of the JOURNAL), and during the Congress seventy Addresses, Lectures and Papers were read at eighteen meetings.

The Members and Delegates were most hospitably entertained at a Reception and Conversazione in the Town Hall by the Mayor and Corporation ; at Garden Parties by the Earl and Countess of Malmesbury and Mr. H. Gordon Selfridge ; and at Excursions and Visits by the Mayor and Corporation of Poole, Mr. A . C. B. Lloyd, Chairman of the Swanage Urban District Council, the Bournemouth Gas and Water Co., Messrs. Thos. Wragg & Sons, Ltd., South Western Pottery, Parkstone, Messrs. Sharp, Jones & Co., Bourne Valley Pottery and Rock Concrete Tube Works, and Messrs. Carter & Co., Ltd., Encaustic Tile Works. A whole-day excursion was arranged on Saturday, July 29th, to Southampton, where the " Olympic " and " Maure-

tania" were inspected by special invitation of the White Star Line and the Cunard Steamship Co.

The numbers attending the Congress were 528 Delegates, representng 295 Government Departments, Dominion and Foreign Governments, Municipal Authorities, and Learned Institutions; 217 Fellows, Members and Associates of the Institute (in addition to those appointed Delegates); 110 Associates of the Congress, ladies and others; 125 Complimentary and Press, making a total of 970.

Reports of the work done in the different Sections and Conferences and the resolutions passed were read by the respective Secretaries at the Closing Meeting, and the resolutions were referred to the Council of the Institute for consideration. Votes of thanks were accorded to the Local Committee and to those who had so hospitably received the Members and Delegates during the Congress.

The Exhibition was held in the Drill Hall, Holdenhurst Road, Bournemouth, and attracted 7,434 visitors. Although the Hall was rather small, 49 exhibitors were accommodated, who made a very effective and varied display; 16 Silver and 28 Bronze Medals were awarded, and 7 exhibits were commended by the judges.

Silver Medals.

Bournemouth Gas and Water Co., Poole Hill, Bournemouth.
British Commercial Gas Association Smoke Abatement Exhibit.

Bournemouth & Poole Electricity Supply Co., Ltd., Electric House, Yelverton Road, Bournemouth.
Belling Modernette Cooker and other Electrical Domestic Appliances.

British, Foreign & Colonial Automatic Light Controlling Co., Ltd., The.
100 and 102, Holdenhurst Road, Bournemouth.
Automatic Controllers of Lighting and Water Supply.

Carter & Co., Ltd., Poole, Dorset.
Glazed Tiles and Mosaics.

Dominion Machinery Co., Ltd., Union Street South, Halifax.
Elliot Woodworker.

Doulton & Co., Ltd., Lambeth, London, S.E. 1.
"London" Waste Water Preventer Valve.

Farrer, William E., Ltd., Star Works, Heath Mill Lane, Birmingham.
Farrer's Improved Automatic Sewage Distributor.

Flavel, Sidney & Co., Ltd., Eagle Foundry and Imperial Works, Leamington.
Flavel's Parlour Oven Grate with Gas Auxiliaries.

Jennings, George, South Western Pottery, Parkstone, Dorset.
Salt Glazed Stoneware.

NATHAN, JOSEPH, & CO., LTD., 56, Osnaburgh Street, London, N.W. 1.
"Glaxo" Dried Milk.

PATERSON ENGINEERING CO., LTD., THE, Windsor House, Kingsway, London, W.C. 2.
Chloronome (Pulsing Meter Type).

PATERSON ENGINEERING CO., LTD., THE, Windsor House, Kingsway, London, W.C. 2.
The "Fluxograph" Flow Recorder.

ROWE BROS. & CO., LTD., Canon's Marsh, Bristol.
Lead Piping.

SHARP, JONES & CO., Bourne Valley Works, Parkstone, Dorset.
Rock-Concrete Sewer Manhole.

SHARP, JONES & CO., Bourne Valley Works, Parkstone, Dorset.
Salt-Glazed Stoneware.

TINTOMETER, LTD., THE, The Colour Laboratory, Salisbury.
Dr. Oliver's Hæmoglobinometer, improved form of.

BRONZE MEDALS.

"AURORASCOPE" CO., LTD., THE, Fulwood House, Fulwood Place, Holborn, London, W.C. 1.
The "Aurorascope" and Attachments.

BERTRAMIC FLOORINGS CO., THE, Bertramic Works, Balmoral Grove, Brewery Road, London, N. 17.
Bertramite Marble Plaster.

BOURNEMOUTH GAS AND WATER CO., Poole Hill, Bournemouth.
Exhibit of Gas Cooking Apparatus.

CROWE, G. E. W., 83, Pall Mall, London, S.W. 1.
"Barnet" Refrigerator.

DOULTON & CO., LTD., Lambeth, London, S.E. 1.
Deep "Lambeth" Sinks.

DOULTON & CO., LTD., Lambeth, London, S.E. 1.
Porcelain Filter with Glazed Joint.

DOULTON & CO., LTD., Lambeth, London, S.E. 1.
Drinking Bubbling Fountain with hooded Jet.

FARRER, WILLIAM E., LTD., Star Works, Heath Mill Lane, Birmingham.
Farrer's Improved Double Trough Lavatory.

FARRER, WILLIAM E., LTD., Star Works, Heath Mill Lane, Birmingham.
Farrer's Non-corrodible Flushing Cistern.

FERODO, LTD., Sovereign Mills, Chapel-en-le-Frith.
Ferodo Stair Treads.

FLAVEL, SIDNEY & CO., LTD., Eagle Foundry, Leamington.
Flavel's Whirl Gas Burners.

HARRISON, G. W., & CO., Napier Lead Works, Laisterdyke, Bradford.
"Harriap" Flushing Cistern.

HOLT'S PATENTS, LTD., 29-31, Westmoreland Street, Liverpool.
"Swan" Silencer.

JENNINGS, GEORGE, South Western Pottery, Parkstone, Dorset.
Combined Yard and Tidal Trap.

KENNEDY'S (BOURNEMOUTH), LTD., 49, Holdenhurst Road, Bournemouth.
Ken Weir Lavatory Basin.

KENNEDY'S (BOURNEMOUTH), LTD., 49, Holdenhurst Road, Bournemouth.
" Ken " Hot Water Grate.

KIRBY, FAIRBANK, LTD., 383, Cleethorpe Road, Grimsby.
Cod Liver Oil Emulsion.

LACRE MOTOR CAR CO., LTD., 78, York Road, London, N. 1.
Lacre 30-H.P. Model " O " Chassis with Special Body and Tipping Gear.

MELDRUMS LTD., Timperley, near Manchester.
Sack Portable Steam Disinfector.

MURCHIE, H., 130, Glenny Road, Barking, Essex.
Murchie's Reversible Windows.

NEWTON CHAMBERS & CO., LTD., Thorncliffe, near Sheffield.
" Izal."

PATERSON ENGINEERING CO., LTD., THE, Windsor House, Kingsway, London, W.C. 2.
Osilameter.

RAWLPLUG CO., LTD., THE, Gloucester House, Cromwell Road, London, S.W. 7.
Rawlplugs.

RIPPERS, LTD., Castle Hedingham, Essex.
Hospital Doors.

ROWE BROS. & CO., LTD., City Lead Works, Canon's Marsh, Bristol.
" New Librex " Lavatory Basin.

" SANITAS " CO., LTD., THE, Locksley Street, Limehouse, London, E. 14.
Sanitas Bactox.

STEWART, J. F., & CO., LTD., Paisley Works, Sugar House Lane, Stratford, London, E. 15.
White Porcelain Enamelled Cast Iron Bath Room Accessories.

WATSON, A. R. & CO., Bembridge, Isle of Wight.
The Ejeculator.

THE JUDGES DESIRE ALSO TO COMMEND THE FOLLOWING EXHIBITS :

BERKEFELD FILTER CO. (BRITISH), THE, Sardinia House, Kingsway, London, W.C. 2.
Improved Berkefeld Filter.

DOULTON & CO., LTD., Lambeth, London, S.E. 1.
" Ideal " and " Cunard " Pattern Lavatory Supports.

HOLTS' PATENTS, LTD., 29-31, Westmoreland Street, Liverpool.
" Swan " Fireclay Cistern.

JENNINGS, GEORGE, South Western Pottery, Parkstone, Dorset.
Jennings Joinders.

MELDRUMS, LTD., Timperley, near Manchester.
Self-contained Refuse Destructor.

TARRANT, H. C., 56, Evelyn Road, Winton, Bournemouth.
Exhibit of Practical Plumbers' Work.

NATIONAL COUNCIL FOR COMBATING VENEREAL DISEASES, 80, Avenue Chambers, Southampton Row, London, W.C. 1.
General Exhibit.

SELECTED FOR FURTHER CONSIDERATION OR PRACTICAL TRIAL.

BACON & CURTIS, LTD., 106, Old Christchurch Road, Bournemouth.
General Exhibit.

ELECTRIC APPLIANCES CO., LTD., 8, Fisher Street, Holborn, London, W.C. 1.
Eureka Vacuum Cleaner.

HOOVER SUCTION SWEEPER CO., LTD., THE, Walmer House, 288-292, Regent Street, London, W. 1.
Electric Hoover Suction Sweeper.

SMETHURST, HERBERT & SONS, LTD., Progress Works, Stanley Road, Hollinwood, Oldham, Lancs.
The "Vigoratair."

DOULTON & CO., LTD., Lambeth, London, S.E. 1.
Three Way Mixing Box.

EXAMINATIONS.

Since the last issue the following examinations have been reported :—

Wellington, Christchurch, Dunedin and Auckland, New Zealand, April 5th, 1922.

Glasgow, June 23rd and 24th. Birmingham, June 30th and July 1st.
London, July 14th and 15th.

For Sanitary Surveyors, India.
Bombay, March 31st, and April 1st and 3rd.

For Inspectors of Meat and other Foods.
Leeds, July 7th and 8th.

At these examinations 280 candidates presented themselves, and the following were awarded certificates :—

Sanitary Science as applied to Buildings and Public Works.

CLARKE, VINCENT COOPER, *East Sheen.*
DESBLEDS, EDOUARD MARC, *Maida Vale.*
FISCHER, ALBERT GEORGE, *Tamaru.*
HUNT, ARTHUR, *Crawley.*
JONES, CHARLES WHITTINGTON, *Christchurch.*
WRIGHT, CLIFFORD GEORGE, *East Ham.*

Maternity and Child Welfare Workers.

FOLEY, HELEN ARAM, *Greenwich.*

Women Health Visitors and School Nurses.

BALL, ALICE MAUD EVELYN, *Wolverhampton.*
BARRETT, DOROTHY, *Durham.*
BREWER, CATHERINE FRANCES, *Bristol.*
CAMBRIDGE, LILIAN ELIZABETH, *Southampton.*
CARTER, ROSE FLORENCE, *Wood Green.*
COOPER, OLIVE MARJORIE, *Clapham.*
COHEN, KATHLEEN MARION, *Blythe Bridge.*
DAVIES, MARY, *Leicester.*
ESPLIN, MAGGIE, *Forfar.*
FEELEY, HONORA, *Bexley Heath.*
GRIFFITHS, ELIZABETH LOUISA, *Bromyard.*
HARRIS, EVELYN MARY, *Leicester.*
HARVIE, MABEL, *Farnborough.*
HERFORD, BERYL MARY, *Cupar.*

HUDSON, GRACE ELLEN, *Croydon.*
HUMPHREY, ELIZABETH, *Brixton.*
LEWIS, KATHLEEN AMY, *Leicester.*
MACKINTOSH, BELLA ROLLO, *Rattray.*
MILNE, MARGARET FORREST, *Motherwell.*
PALING, IDA, *Saltburn-by-the-Sea.*
RIACH, ELLA FLORENCE FRIDGE, *Forres.*
RUTHERFORD, ELLEN, *Clapham.*
SAUNDERS, ALICE MAUDE MARY, *Walsall.*
SEIPPEL, RUTH SOLVEIG, *Southampton.*
SHARP, MONA MOOR, *London.*
SHOTTER, ALICE MAUD, *Hackney.*
THOMSON, CONSTANCE LENA, *Haywards Heath.*
THOMSON, MAGGIE FLEMING, *Southampton.*
WALKLEY, MABEL, *Rednal.*
WATSON, HILDA JESSIE, *Stroud.*
WEALE, LOUISE, *West Bromwich.*

School Hygiene, including Elementary Physiology.

BLACKWOOD, MARJORIE WILSON, *Ilford.*
BONSER, EILEEN MARY, *London.*
CHAMBERLAIN, MABEL VIOLET, *Bedford.*
DARROLL, MARGERY, *Erdington.*
DAVIES, JEAN, *Kensington.*
DUNCAN, HILDA MILLICENT, *Strathpeffer.*
EDMONDS, CONSTANCE LAURETTA, *Erdington.*
EVANS, DOROTHY VIOLET, *Erdington.*
GARNER, MARY, *Erdington.*
GOWANS, EILEEN, *Bromley.*
GREGG, CAROLINE EDITH, *Erdington.*
HUGHES, FANNIE, *Radway.*
INGHAM, MARJORIE LOIS, *Erdington.*
KEMP, DOROTHY OLIVER, *Erdington.*
KERR, NORA SUNDERLAND, *Ramsay.*
LAW, WINIFRED JESSIE LILLA, *West Ealing.*
MARSDEN, HILDA, *Bedford.*
MAYNE, EVA CLARE BUCKLEY, *Kensington.*
MILES, ELLINOR BROCK, *Kensington.*
PARSONS, EDWINA MARY, *Norwood.*
PEIRSON, FRANCES THERESA, *Erdington.*
PRESTON, MARY, *Erdington.*
ROBSON, VERA HOPE, *Dulwich.*
ROFE, LAURA HERBERTA FRIEDA, *Erdington.*
TERRILL, WILLIAM JAMES, *Shanghai.*
THEILER, MARGARET, *Erdington.*
THOMPSON, FLORENCE ROSE, *Smethwick.*
WAITE, DOROTHY ELENOR, *Ealing.*
WHITAKER, ZITA RYLAND, *Erdington.*
WHITTON, MAY, *Dulwich.*
WHITE, EDITH CHARLOTTE VALENTINE *Willesden.*
WILSON, ALINE, *Erdington.*
WOODS, GRETTA, *Dulwich.*

Sanitary Inspectors.

BARTON, ERNEST WILLIAM, *Dartford.*
BOOTH, JOHN, *Reddish.*
BRANNEN, EDWARD WILFRED, *Aberdeen.*
CRUTE, WILLIAM JOHN, *Gillingham.*
FIRTH, ANTHONY LEAMING LAURENCE *Hemel Hempsted.*
FREEMAN, JAMES ALBERT, *Dunedin.*
GRANT, THOMAS ERNEST, *Highbury.*
HAMILTON, WILLIAM FINDLAY, *Bathgate.*
HAWORTH, HERBERT, *Cashmere.*
HERBERT, CHARLES, *Madeley.*
JANES, GILBERT, *Aylesbury.*
JESSE, JOSEPH HAROLD, *Southall.*
JORDAN, THOMAS PERCIVAL, *Knighton.*
MCCALLUM, ALAN HENDERSON, *Ravensbourne.*
MANLEY, MARY, *Crewe.*
MILNE, PHILIP ALEXANDER, *Auckland.*
MURRAY, RUTH, *Jarrow-on-Tyne.*
PADGHAM, THOMAS HERBERT, *Northiam.*
PALMER, FRANK SPENCER, *Burwood.*
PENKETH, JAMES, *Palmerston.*

RICHARDSON, JAMES RUSSELL (Jun.), *Wanganui.*
SALTER, JOSEPH HOUSE, *Gravesend.*
STAMP, HORACE ROWLAND, *Thames Ditton.*
STOWER, JOSEPH, *Weston-super-Mare.*
WATERIDGE, ERNEST EDWARD, *London.*
WALKER, JOSEPH, *Rayleigh.*
WALLER, JAMES, *Aldershot.*
WARRENER, WINIFRED ROSE, *Mortlake.*
WILSON, ANDREW ALEX, *Dundee.*

Smoke Inspectors.

CLINCH, HERBERT GEORGE, *Halifax.*

Tropical Hygiene for Sanitary Inspectors.

JULY, FERDINAND JEAN, *Hampstead.*

Sanitary Surveyors, India.

AGRAWALA, PRABHUDAYAL D., *Ajmer.*
BANAVLIKER, BALVANT M., *Bombay.*
BAWEJAH, LACHHMAN DASS, *Bahawalpur.*
BHATTACHARJEE, JAMINI NATH, *Asansol.*
BHATTACHARYYA, DHIRENDRANATH, *Tippera.*
DEVRUKHKAR, BALKRISHNA ANANT *Bombay.*
DHARADHAR, S. B., *Matunga.*
FERNANDEZ, J. STEPHEN, *Bombay.*
GHATAK, DIGINDRA CHANDRA *Mymensing.*
HEMRAJANI, H. N., *Bombay.*
HOSHANGSHA, NANAVATI NASERWANJI, *Bombay.*
JANKIVALLABH, P., *Rutlam.*
JAYAKAR, G. A., *Bombay.*
JOSHI, RATILAL SHAMBHOOSHANKER, *Shanta Cruz.*
KAR, BIRENDRA KUMAR, *Sylhet.*
KETKAR, R P., *Poona.*
MOJUMDER, HEMAJA KANTA, *Mymensingh.*
MOJUMDER, PRAKASH CHANDRA *Patna.*
MULAY, N. A., *Umbargaon.*
NAIDU, P. R., *Bombay.*
NAIDU, G. VENKET RAO, *Nagpur.*
NATH, CHANDRA MOHAN, *Dacca.*
NATH, SACHINDRA CHANDRA, *Mandra.*
PALSOKER, K. Y., *Karanja.*
PATHAK, HARIPRASAD JAYASHANKER, *Jamnagar.*
PARIKH, MOHANLAL PARBHUDAS, *Nadiad.*
PEREIRA, JOSEPH PATRICK, *Bombay.*
RAO, P. MAHADEO, *Hindrapur.*
RAJLIINGAM, M. S., *Akola.*
RANEY, M. R., *Katol.*
SAMSON, SAMUEL, *Tembi.*
SANYAL, NARESH CHANDRA, *Jalpaiguri.*
D'SILVA, M. A., *Santa Cruz.*
SUNAVALA, D. F., *Bombay.*
TALAPATRA, BHUPENDRA CHANDRA, *Tipperah.*
TARAN, RAMESH CHANDRA, *Calcutta.*
TRILOKIKER, S. A., *Bombay.*
VAIDYA, H. G., *Poona.*
VAZKAR, G. S., *Bombay.*

Inspectors of Meat and other Foods.

BLAYLOCK, ROBERT THEODORE, *Sunderland.*
DAWSON, CHARLES JOSEPH, *Bolton.*
FOX, SYDNEY, *Hemsworth.*
HAMMOND, LEONARD, *Wakefield.*
HORSFIELD, ARTHUR BUCKLEY, *Leeds.*
JULY, FERDINAND JEAN, *South Hampstead.*
NORTHWAY, DAVID, *Sheffield.*
ROBINSON, DOUGLAS EDGAR, *Keighley.*
SHUTTLEWORTH, EDWARD, *Blackburn.*
SWIFT, SYDNEY, *Castleford.*
TOWNSEND, WILLIAM WILKINSON, *Huddersfield.*
YATES, JOHN, *Wakefield.*

DOMINION AND FOREIGN NOTES.

During July there have been many visitors to the Institute from the Dominions and foreign countries, including : –

Dr. A. Campbell Burnham, from the United States Red Cross Society.

Mr. J. B. Henson, from New South Wales.

Mr. E. Kilner, Chief Health Inspector of Shanghai.

Dr. Minett, from British West Indies.

Prof. T. A. Starkey, of McGill University, Montreal.

Sister M. Searle, from Tasmania.

At the Congress held in Bournemouth in July the Council were glad to have the opportunity of welcoming Delegates from 7 foreign Governments and Municipalities, from 9 Dominion Governments, and from 14 Universities, Societies and Municipal Authorities in the Dominions.

The Council have to report with regret the death of Mr. W. J. Perrott, the Secretary and Treasurer of the South African Branch, which occurred after a short illness on June 21st. Mr. Perrott undertook the secretarial work of the Branch only in June last year, but his loss will be keenly felt by the Institute as well as by the Branch Council. Mr. F. L. T. Mitton, F.C.S.A., has been temporarily appointed as Secretary to the Branch and to the South African Board of Examiners, and the office address remains at St. George's House, 73, St. George's Street, Cape Town.

Dr. P. Bollen, Medical Officer of Health, Port Adelaide, South Australia, who had been an Examiner in South Australia since 1909, died in June, 1922.

FORTHCOMING MEETINGS.

Lectures.

The Introductory Lecture to the Autumn Courses of Students' Lectures will be delivered by Louis C. Parkes, M.D., D.P.H., on September 25th, at 5.30 p.m.

The Courses for Sanitary Officers will commence on September 27th ; for Health Visitors and Child Welfare Workers, on September 29th ; for Meat and Food Inspectors, on October 6th ; and for Army Officers and Professional Men on November 6th.

Lectures on Tropical Hygiene.

It is hoped to arrange at the Institute in November a short Course of Lectures on Tropical Hygiene for Sanitary Inspectors, which will be open

free to any interested in the subject. Fuller details will be announced in the November issue of the JOURNAL.

SESSIONAL MEETING.

Cardiff.—Friday, October 13th, at 4.30 p.m., in the Town Hall. Discussions on "Health Education of Children," to be opened by J. S. Peebles, L.R.C.P., L.R.C.S., D.P.H., Medical Officer of Health, Bridgend U.D.C., and on "Open Air Schools," by E. E. Morgan, M.C., A.R.I.B.A., Borough Architect, Swansea. At 4 p.m., the Lord Mayor is kindly arranging to entertain the members and others to tea.

On Saturday, October 14th, visits will be made to places of local interest.

HEALTH WEEK.

His Majesty the King, and Her Majesty the Queen, have graciously accorded their patronage to Health Week, which is to be held from October 8th to 14th. The Right Hon. The Lord Mayor of London has consented to act as Chairman of the General Committee.

Members of the Institute are invited to co-operate in promoting the success of the movement. Those prepared actively to assist are asked to send in their names to the Secretary.

EXAMINATIONS.

In Sanitary Science as applied to Buildings and Public Works, for Sanitary Inspectors, Maternity and Child Welfare Workers, Women Health Visitors and School Nurses, and School Hygiene, including Elementary Physiology, will be held at :—

Derby, October 13th and 14th.	Newcastle, Nov, 10th and 11th.
York, October 20th and 21st.	Liverpool, Nov. 17th and 18th.
Manchester, October 27th and 28th.	London, December 8th and 9th.
Brisbane, October.	Adelaide, December.
Melbourne, Victoria, November.	

For Inspectors of Meat and other Foods :—

Bristol, November 3rd and 4th.	Liverpool, December 1st and 2nd.
Newcastle, November 10th and 11th.	London, December 15th and 16th.

CONGRESSES, 1923 AND 1924.

The Council have accepted invitations from the City Council of Hull for the Congress and Exhibition in 1923, and from the City Council of Liverpool for the Congress and Exhibition in 1924.

Calendar for September, October, November and December,

As far as at present arranged.

SEPTEMBER.

25 M. Introductory Lecture to Students attending the Autumn Courses, at 5.30 p.m., by Louis C. Parkes, M.D., D.P.H., M.R.C.S.

27 W. Lecture to Sanitary Officers, at 6 p.m. Public Health Acts—English, Scotch, Irish ; other Statutes relating to Public Health, by Charles Porter, M.D., B.SC., M.O.H., St. Marylebone.

29 F. Lecture to Sanitary Officers, at 6 p.m. Public Health (London), etc., by Charles Porter, M.D., B.SC.

29 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Personal Hygiene, Importance of Cleanliness, by J. A. H. Brincker, B.A., M.D., D.P.H.

OCTOBER.

2 M. Lecture to Sanitary Officers, at 6 p.m. Factory and Workshop Acts, Smoke Legislation, Food and Drugs Act, 1899, by Charles Porter, M.D., B.SC.

2 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. The Growth and Development of the Child, by J. A. H. Brincker, B.A., M.D., D.P.H.

3 Tu. Demonstration to Sanitary Officers, at the Public Health Offices, 10, Compton Terrace, Upper Street, Islington, N., at 6 p.m. Book-keeping as carried out in a Sanitary Inspector's Office, by G. Clark Trotter, M.D., D.P.H., M.O.H., Islington.

4 W. Lecture to Sanitary Officers, at 6 p.m. Duties of a Sanitary Inspector. General, A., Outdoor, by Charles Porter, M.D., B.SC.

4 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Hygiene of the Special Senses, by Mrs. Margaret C. M. Hogarth, M.B., CH.B.

6 F. Lecture to Sanitary Officers, at 6 p.m. Duties of a Sanitary Inspector. General, B., Indoor, by Charles Porter, M.D., B.SC.

6 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Physical Development, by Mrs. Margaret C. M. Hogarth, M.B.., CH.B.

6 F. Lecture to Meat Inspectors, at the Institute, at 6 p.m., by J. R. Hayhurst M.R.C.S., D.V.S.M. (Vict.), Superintendent, Metropolitan Cattle Market.

7 S. Inspection and Demonstration in the District of Chiswick, at 2.30 p.m. Conducted by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

8th to 14th—Health Week.

9 M. Demonstration to Sanitary Officers on Meterological Instruments in the Parkes Museum, at 5.30 p.m., by the Director, E. White Wallis, F.S.S.

9 M. Lecture to Sanitary Officers, at 6 p.m. Duties of a Sanitary Inspector—C : Offensive Trades and Trade Nuisances, etc., by Charles Porter, M.D., B.SC.

9 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Physical Conditions affecting Health in Schools, by Mrs. Margaret C. M. Hogarth, M.B.

11 W. Inspection and Demonstration at Edward Cook & Co.'s Soap Works, Bow, E., at 2.30 p.m.

11 W. Lecture to Sanitary Officers, at 6 p.m. Elementary Science : Physics, Chemistry, by Alan E. Munby, M.A., F.R.I.B.A.

11 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Duties and Powers of Health Visitors, by G. F. Buchan, M.D., D.P.H., M.O.H., Willesden.

13 F. Lecture to Sanitary Officers, at 6 p.m. Elementary Science : Physics, Chemistry, by Alan E. Munby, M.A., F.R.I.B.A.

13 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Hygiene of the Home, by Miss N. T. F. de Chaumont, Sanitary Inspector, Kensington.

13 F. } **Sessional Meeting, Cardiff,** in the Town Hall, at 4.30 p.m. Discussions on
14 S. } " Health Education of Children " and " Open Air Schools," to be opened by J. S. Peebles, L.R.C.P., L.R.C.S., D.P.H., Medical Officer of Health, Bridgend U.D.C., and E. E. Morgan, M.C., A.R.I.B.A., Borough Architect, Swansea.

13 F. }
14 S. } Examinations—Derby.

14 S. Demonstration—Meat Inspectors, at Metropolitan Cattle Market, at 12.30 p.m. Conducted by J. R. Hayhurst, M.R.C.V.S.

16 M. Demonstration to Sanitary Officers on Meterological Instruments in the Parkes Museum, at 5.30 p.m., by the Director, E. White Wallis, F.S.S.

16 M. Lecture to Sanitary Officers, at 6 p.m. Elementary Science : Physics, Chemistry, by Alan E. Munby, M.A., F.R.I.B.A.

16 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Sociological Conditions, by Miss N. T. F. de Chaumont, Sanitary Inspector, Kensington.

17 Tu. Lecture to Sanitary Officers, at 6 p.m. Elementary Science : Physics, Chemistry, by Alan E. Munby, M.A., F.R.I.B.A.

18 W. Inspection and Demonstration in the District of Chiswick, at 2.30 p.m. Conducted by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

18 W. Lecture to Sanitary Officers and to Health Visitors and Child Welfare Workers, at 6 p.m. Elementary Statistics, by Joseph Priestley, M.D., D.P.H., M.O.H., Lambeth.

20 F. Lecture to Sanitary Officers, at 6 p.m. Infectious Diseases, by Joseph Priestley, M.D., D.P.H.

20 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Home Visiting and Advice, by Miss N. T. F. de Chaumont, Sanitary Inspector, Kensington.

20 F. Lecture to Meat Inspectors at the Institute, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S.

20 F. }
21 S. } Examinations—York.

21 S. Demonstration—Meat Inspectors, Metropolitan Cattle Market, at 12.30 a.m.

21 S. Inspection and Demonstration at Messrs. B. Davies & Sons' Dairy Premises, King Street, Portman Square, W., 2.30 p.m., conducted by Mr. B. Davies.

23 M. Lecture to Sanitary Officers, at 6 p.m. Methods of Disinfection, by Joseph Priestley, M.D., D.P.H.

23 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Health Talks and Home Nursing, by Mrs. Lomax-Earp.

24 Tu. Lecture to Sanitary Officers, at 6 p.m. Water : Composition, Pollution and Purification, by Joseph Priestley, M.D., D.P.H.

24 Tu. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Home Economics and Cookery, by Mrs. K. Lomax-Earp.

25 W. Inspection and Demonstration in the District of Islington, at 2.30. Conducted by G. Clark Trotter, M.D., D.P.H., M.O.H., Islington.

25 W. Lecture to Sanitary Officers and Health Visitors and Child Welfare Workers, at 6 p.m. Sanitary Appliances, by W. C. Tyndale, O.B.E., M.INST.C.E.

27 F. Lecture to Meat Inspectors at Institute, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S.

27 F. Lecture to Sanitary Officers and Health Visitors and Child Welfare Workers, at 6 p.m. House Drainage, by W. C. Tyndale, O.B.E., M.INST.C.E.

27 F.
28 S. } Examinations—Manchester.

28 S. Demonstration—Meat Inspectors, Metropolitan Cattle Market, Islington, N., at 12.30 p.m. Conducted by J. R. Hayhurst, M.R.C.V.S.

28 S. Inspection and Demonstration at the Lambeth Disinfecting Station, at 2.30 p.m. Conducted by Joseph Priestley, M.D., D.P.H.

30 M. Introductory Lecture to Commissioned Officers, at 3.30 p.m., by Colonel C. H. Melville, C.M.G., M.B.

30 M. Lecture to Sanitary Officers, at 6 p.m. Details of Plumbers' Work, by Walter Scott.

30 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Water Supply: Fittings and Ventilation in the Home, by J. H. Clarke, Chief Sanitary Inspector, Chiswick.

31 Tu. Demonstration to Commissioned Officers, at Smithfield Market, at 11 a.m. Conducted by Lieut.-Colonel T. Dunlop Young, O.B.E., M.R.C.V.S., D.V.S.M.

31 Tu. Lecture to Commissioned Officers, at 4 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

31 Tu. Lecture to Sanitary Officers and to Health Visitors and Child Welfare Workers, at 6 p.m. Ventilation and Warming, by Edward Willis, Esq., M.INST.C.E., F.S.I., Engineer and Surveyor, Chiswick.

NOVEMBER.

1 W. Inspection and Demonstration at L.C.C. Municipal Lodging House, Kemble Street, Drury Lane, W.C., at 2.30 p.m.

1 W. Lecture to Commissioned Officers, at 3.30 p.m. Canteen Supplies: Eggs, Butter, Cheese, Bacon, Lard, by C. L. T. Beeching, F.G.I.

1 W. Lecture to Sanitary Officers, at 6 p.m. Calculations, Measurements and Plans and Sections, by W. C. Tyndale, O.B.E., M.INST.C.E.

1 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Organisation and Management of Infant Welfare Centres and Clinics, by Mrs. Flora Shepherd, M.B., CH.B., Assistant M.O.H., Hornsey.

2 Th. Lecture to Commissioned Officers, at 4 p.m. Meat Inspection by J. R. Hayhurst, M.R.C.V.S.

3 F. Lecture to Commissioned Officers, at 3.30 p.m. Canteen Supplies: Tea, Coffee, Cocoa, Chocolate, Sugar, by C. L. T. Beeching, F.G.I.

3 F. Lecture to Sanitary Officers, at 6 p.m. Building Materials, by Edward Willis, M.INST.C.E., F.S.I.

3 F. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Official and Voluntary Agencies administering to Child Welfare: The Children Act by Mrs. Flora Shepherd, M.B., CH.B.

3 F. Lecture to Meat Inspectors, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

3 F.
4 S. } Meat Examination—Bristol.

4 S. Inspection and Demonstration at Schools and Public Buildings, Chiswick, at 2.30 p.m. Conducted by Edward Willis, M.INST.C.E., Engineer and Surveyor, Chiswick.

6 M. Lecture to Commissioned Officers, at 3.30 p.m. Vegetables and Fruits, Jams, Condiments, etc., Prepared, Concentrated and Preserved Foods, by Colonel C. H. Melville, C.M.G., M.B.

6 M. Lecture to Sanitary Officers, at 6 p.m. Building Sites, by Edward Willis, M.INST.C.E., F.S.I.

6 M. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Prevention of Communicable Disease, by R. Veitch Clark, M.A., M.D., B.SC., D.P.H., M.O.H., Croydon.

7 Tu. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m. Conducted by Lieut.-Colonel T. Dunlop Young, O.B.E., M.R.C.V.S., D.V.S.M.

7 Tu. Lecture to Commissioned Officers, at 4 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

8 W. Inspection and Demonstration in the District of Islington, at 2.30 p.m. Conducted by G. Clark Trotter, M.D., D.P.H.

8 W. Lecture to Commissioned Officers, at 3.30 p.m. Canteen Supplies : Rice : Arrowroot, Flour, Biscuits, by C. L. T. Beeching, F.G.I.

8 W. Lecture to Sanitary Officers, at 6 p.m. Sewerage, by A. J. Martin, M.INST.C.E.

8 W. Lecture to Health Visitors and Child Welfare Workers, at 6 p.m. Prevention of Communicable Disease, by R. Veitch Clark, M.A., M.D.

9 Th. Demonstration to Commissioned Officers at the Metropolitan Cattle Market, at 11 a.m. Conducted by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

9 Th. Visit to Factory for Commissioned Officers. Conducted by C. L. T. Beeching.

10 F. Lecture to Commissioned Officers, at 3.30 p.m. Canteen Supplies : Jams, Preserved Fruits, Condiments, Lime Juice, etc., by C. L. T. Beeching.

10 F. Lecture to Sanitay Officers, at 6 p.m. Sewage Disposal, by A. J. Martin, M.INST.C.E.

10 F. Lecture to Health Visitors, at 6 p.m. Tuberculosis, by R. Veitch Clark, M.A., M.D., B.SC., D.P.H.

10 F. Lecture to Meat Inspectors, at 6 p.m., by J. R. Hayhurst, M.R.C.V.S.. D.V.S.M.

10 F.
11 S. } Examinations and Meat Examination— Newcastle-upon-Tyne.

11 S. Demonstration—Meat Inspectors, Metropolitan Cattle Market, at 12.30 p.m.

11 S. Inspection and Demonstration at Sewage Works, at 2.30 p.m. Conducted by A. J. Martin, M.INST.C.E.

11 S. Demonstration to Health Visitors and Child Welfare Workers in the Parkes Museum, at 3 p.m. Conducted by J. H. Clarke.

13 M. Lecture to Commissioned Officers, at 3.30 p.m. Alcoholic Beverages : Beer, Whisky, Brandy, etc., by Col. C. H. Melville, C.M.G., M.B.

13 M. Lecture to Sanitary Officers, at 6 p.m. Water Supply, by W. Matthews, M.INST.C.E.

13 M. Lecture to Health Visitors, at 6 p.m. Venereal Diseases, by J. Letitia Fairfield, C.B.E., M.D., D.P.H.

14 Tu. Demonstration to Commissioned Officers at Smithfield Market, at 11 a.m.

14 Tu. Lecture to Commissioned Officers, at 4 p.m. Meat Inspection, by J. R. Hayhurst, M.R.C.V.S., D.V.S.M.

15 W. Inspection and Demonstration at Van den Bergh's Margarine Works, Fulham, at 2.30 p.m.

15 W. Lecture to Sanitary Officers, at 6 p.m. Scavenging, Disposal of House Refuse, by W. R. Hicks, A.M.INST.C.E., Borough Engineer, Ealing.

LIST OF MEMBERS AND ASSOCIATES

ELECTED JULY, 1922.

MEMBERS.

* Sanitary Science Certificate.
w Maternity and Child Welfare Workers' Certificate.
§ Sanitary Surveyors' (India) Certificate.
‡ Sanitary Inspector's Certificate.
m Meat Inspector's Certificate.
v Women Health Visitors and School Nurses' Certificate.
s School Hygiene Certificate.

4939	1922.	July	*BARCLAY, Alexander, *Plumbing Dept., City Council, Wellington, New Zealand.*
4924	1922.	July	CAPOOR, Jadav Lal, B.SC. (GLASGOW), *21, Cromwell Road, South Kensington, S.W.*
4925	1922.	July	FARID, Aly, *Buildings Dept., Municipal Offices, Dyne Road, Kilburn, N.W.6.*
4926	1922.	July	GIBSON, William Garnett, P.A.S.I., LIC.R.I.B.A., *The Bungalow, Windermere, Westmoreland.*
4927	1922.	July	HARRIS, Kenneth John Sidney, *Town Hall, Georgetown, British Guiana.*
4928	1922.	July	HAYFORD, The Rev. Mark Christian, M.A., D.D., F.R.G.S., *General Superintendent, Baptist Church and Mission House, Accra, Gold Coast, West Africa.*
4940	1922.	July	*IMPEY, Lennox Hamilton, *corner Hamilton and Belvedere Streets, Arcadia, Pretoria, Transvaal, South Africa.*
4929	1922.	July	IYER, Sankar Venkatasubba, B.A.(MADRAS), LL.B.(BOMBAY), L.S.E.(BOMBAY), *69, Dormitories, Byculla, Bombay, India.*
4930	1922.	July	JOLLY, Major Gordon Gray, I.M.S., M.B., CH.B., D.P.H., D.T.M., *Assistant Director of Public Health for Burma, Rangoon, Burma, India.*
4931	1922	July	JUKES, Louis William, F.S.I., M.S.A., F.I.S.E., *Lansdowne House, Castle Lane, Southampton.*
4932	1922	July	KNIGHT, William Henry, *Manufacturing Sanitary Engineer, Fylands Fireclay Works, Bishop Auckland.*
4933	1922.	July	LAKDAWALA, Burjor Manekshah, B.E.(BOMB.), *c/o Mr. H. H. Daruwala, Out-Fort, Broach, Bombay, India.*
4934	1922.	July	MOORE, John Alfred, P.A.S.I., *25, Neville Road, Stoke Newington, N. 16.*
4941	1922.	July	*MOORE, Lewis Jack, *"Templeton," Bridge Road, Torquay, Devon.*
4935	1922.	July	MORRIS, William, *Master Plumber, 84, Rawlinson Road, Southport.*
4936	1922.	July	PENALUNA, Albert John, P.A.S.I., *"Pencoys," Dartford Road, Dartford, Kent.*

4942 1922. July *‡PURDY, Robert, *80, Beach Road, Sparkhill, Birmingham.*

4944 1920. Feb. ROMEIRA, Joaquim Pinto, B.SC.TECH., *Reparticao Dos Servicos Urbanos, City of Loanda, Province of Angola, Portuguese West Africa.*

4943 1922. July *SMITH, Cyril John, *20, Cedar Road, Newport, Mon.*

4937 1922. July WILLIAMS, Cecil Leonard, B.SC., M.R.C.S., D.P.H., *(M.O.H. and S.M.O.), Public Health Dept., Roomfield, Todmorden, Yorks.*

4938 1922. July WREST, James, M.INST.M. & C.E., *Deputy Borough Surveyor, Town Hall, Buxton, Derbys.*

ASSOCIATES.

8869 1895. Dec. ‡BANKS, Joseph G., *Public Health Department, Town Hall, East Ham, E. 6.*

8847 1922. July ‡BIDDLE, William John Hancorne, *6, Langland Road, Mumbles, Swansea.*

8848 1922. July ‡BROOKS, Ralph, *Council Offices, Street, Somerset.*

8845 1922. July COLE, Harold Edward Long, *45, Windsor Road, The Brook, Liverpool.*

8870 1918. June *v*CORBETT, Miss Rebecca A., *Superintendent, Victoria Branch, Victorian Order of Nurses, 1145, Rockland Avenue, Victoria, B.C.*

8849 1922. July ‡CURLE, Wesley William Morris, *Municipal Health Office, Caledon, Cape Province, South Africa.*

8850 1922. July ‡DALE, Harold William, *254, Smithdown Road Sefton Park, Liverpool.*

8851 1922. July ‡DUPONT, Henry James, *La Marne, Mays Hill, Neath, Glam.*

8852 1922. July ‡FOSTER, George Knill, *"Glencoe," Kempley Road, Okehampton, Devon.*

8853 1922. July ‡FURMINGER, Miss Evelyn H., *40, Nelson Street, C.-on-M., Manchester.*

8846 1922. July GIBB, Cecil Harry, *2, Queen's Lane, Queen's Road, Forest Hill, S.E.*

8854 1922. July ‡GREEN, George William, *Factory Lane, Kimberley, Nottingham.*

8855 1922. July ‡HART, Frank Shakespeare, *Sanitary Inspector, Massel Bay, Cape Province, South Africa.*

8856 1922. July ‡HOOPER, John George, *"Y Graig," 10, Carmarthen Street, Llandilo, Carmarthenshire.*

8857 1922. July ‡HORN, Miss Ellen Frances, *P.O. Box 26, c/o Board of Health, Kimberley, South Africa.*

8858 1922. July ‡JEFFORD, William Henry, *The Town Hall, Brixham, Devon.*

8868 1922. July KERR, Miss Beatrice A., *32, Knez Mihailova Venaz, Belgrad, Serbia.*

8859 1922. July ‡McLOUGHLIN, Miss Mary Eleanor, *91a, St. George's Street, Cape Town, South Africa.*

8860 1922. July *v*MARTIN, Miss Marjorie Sinclair, *14, College Gardens, Belfast.*

8861 1922. July ‡MEADE, Francis, *c/o The Sanitary Dept., Hong Kong.*

8862 1922. July ‡PARTRIDGE, George Ernest, *249, Mears Street, Pretoria, South Africa.*

8863 1922. July ‡PRINGLE, John Robert, *17, Secheron Road, Hobart, Tasmania.*

8864 1922. July ‡RILEY, Cyril Ernest, *Sanitary Inspector, Town Hall, Krugersdorp, Transvaal, South Africa.*

8865 1922. July *s*ROBERTS, Mrs. Mary J., *Fernside, Temple Drive, Swinton, Manchester.*

8866 1922. July ‡SCHAAP, Maurice, *4, Married Quarters, Ferriera Deep Street, Johannesburg, South Africa.*

8867 1922. July ‡SHANNON, Miss Elizabeth, *Swanstree Lodge, Sittingbourne.*

ELECTED JULY 28th, 1922.

MEMBERS.

4945 1922. July BOOTH, John Roy Newman, B.SC.(TECH.), *8, Forrest Street, Latchford, Warrington.*

4952 1922. July *CLARKE, Vincent Cooper, P.A.S.I., F.A.I., *13, Park Place, St. James Street, S.W. 1.*

4953 1922. July *CLARKSON, Ernest Hodgson, *22, Industrial Street, Horbury Junction, near Wakefield.*

4954 1922. July *DIAZ-B, Facundo, *73, Broomwood Road, Wandsworth Common, S.W. 11.*

4946 1922. July EVERINGHAM, Alfred, *Deputy Borough Surveyor, 1, The Crescent, Bridlington.*

4959 1922. July HOLDEN, Sandys Jackson Charlesworth, M.D., CH.B., D.P.H., (*M.O.H.*) *12, Rickford's Hill, Aylesbury.*

4947 1922. July MARSLAND, Gilbert Gould, B.SC.(TECH.), *59, Shaw Lane, Dinting, Glossop, near Manchester.*

4956 1922. July MIDDLETON, Harry, M.C., M.B., CH.B., D.P.H. (*M.O.H.*), *Boyne House, Haverfordwest.*

4957 1922. July ODLUM, Miss Doris Maude, M.A.(OXON), B.A. (LOND.), *The Savoy Hotel, Bournemouth.*

4948 1922. July SCOTT, Ralph Roylance, M.R.C.S., L.R.C.P., *10, Manchester Street, W. 1.*

4958 1922. July SHARP, Charles, *Bourne Valley Works, Parkstone.*

4949 1922. July TIGAR, Leonard, A.M.INST.C.E., "*Lakenheath,*" *105, Richmond Park Road, Bournemouth.*

4950 1922. July URQUHART, Alexander, M.A., M.D., D.P.H., (*M.O.H.*), *Aberfeldy House, Shepperton-on-Thames.*

4951 1922 July WILKINSON, Fred, M.INST.M. & C.E., *Engineer and Surveyor, Town Hall, Hunstanton.*

4955 1922. July *WRIGHT, Clifford George, *36, Cotswold Gardens, East Ham, E. 6.*

ASSOCIATES.

8871 1922. July *v*BALL, Miss Alice Maud Evelyn, *25, Wanderers Avenue, Wolverhampton.*

8872 1922. July ‡BARRETT, William, *43, Orchard Road, Street, Somerset.*

8873 1922. July ‡BECKETT, John Leslie, *599, Smithdown Road, Sefton Park, Liverpool.*

8874 1922. July ‡CRUTE, William John, *17, Belmont Road, Gillingham, Kent.*

8875 1922. July ‡DOBSON, William Hooper, *24, Malvern Road, Gillingham, Kent.*

8876 1922. July ‡GRANT, Thomas Ernest, *54, Witherington Road, Highbury, N. 5.*

8877 1922 July ‡HERBERT, Charles, *Engineer and Surveyor, Madeley, Shropshire.*

8878 1922 July ‡HOUGH, Henry Thomas, *10, Sudworth Road, Wallasey, Ches.*

8879 1922. July ‡JORDAN, Thomas Percival, 9A, *Russell Street, Knighton, Radnorshire.*

8889 1913. Jan. ‡MCMILLAN, Miss Jessie Cameron, *Director of Women's Extension Service, Parliament Buildings, Edmonton, Alberta, Canada.*

8880 1922. July *v*PARSONS, Mrs. Helen, *" Tranack," Castle Hill, Bodmin, Cornwall.*

8881 1922. July ‡ROYLANCE, George Edward, *Sanitary Department, Municipal Health Board, Hong Kong.*

8882 1922. July *v*SAUNDERS, Miss Alice Maude Mary, *Walsall Education Committee, Day Nursery Centre, Walsall.*

8883 1922. July ‡STAMP, Horace Rowland, *Council Offices, Portsmouth Road, Thames Ditton.*

8884 1922. July ‡STANLEY, Ralph Ernest, *Sanitary Inspector, Port Health Office, Singapore, Straits Settlements.*

8885 1922. July *s*THOMPSON, Miss Florence Rose, *120, Sycamore Road, Smethwick, Staffs.*

8886 1922. July ‡WALKER, Joseph, *Assistant Surveyor, Rochford R.D.C., Rayleigh, Essex.*

8887 1922. July ‡WALLER, James, *4, Milton Avenue, Newton Drive, Blackpool.*

8888 1922. July ‡WILSON, Andrew A., *Sanitary Dept., West Bell Street, Dundee, Scotland.*

OBITUARY.

It is with regret that the Council have to record the death of the following Members : —

John Lambie, M.D., D.P.H., who was for several years the Medical Officer of Health and School Medical Officer to the Borough of Mansfield. He had been a member of the Institute for nearly ten years and had attended several of the Congresses.

The Dowager Lady O'Hagan, of Pyrgo Park, Essex, who had been a member since 1907.

Harold Ridley, of Scarborough Bridge, York.

Roland Hare Winterbottom, who was the Surveyor and Inspector to the Irlam Urban District Council, and who had been a member for 14 years.

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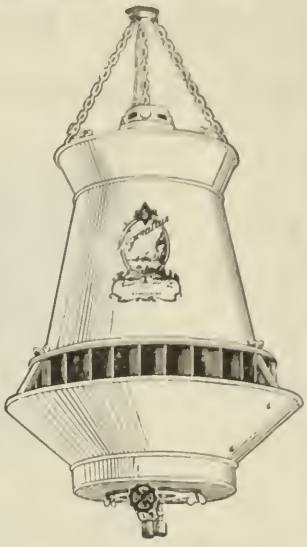

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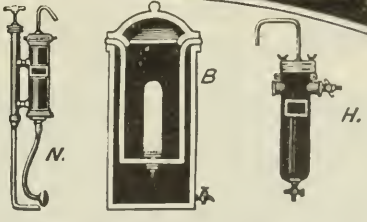

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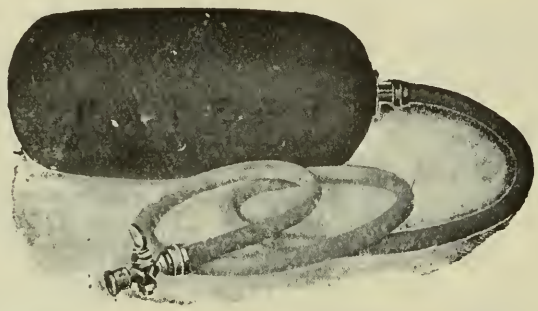

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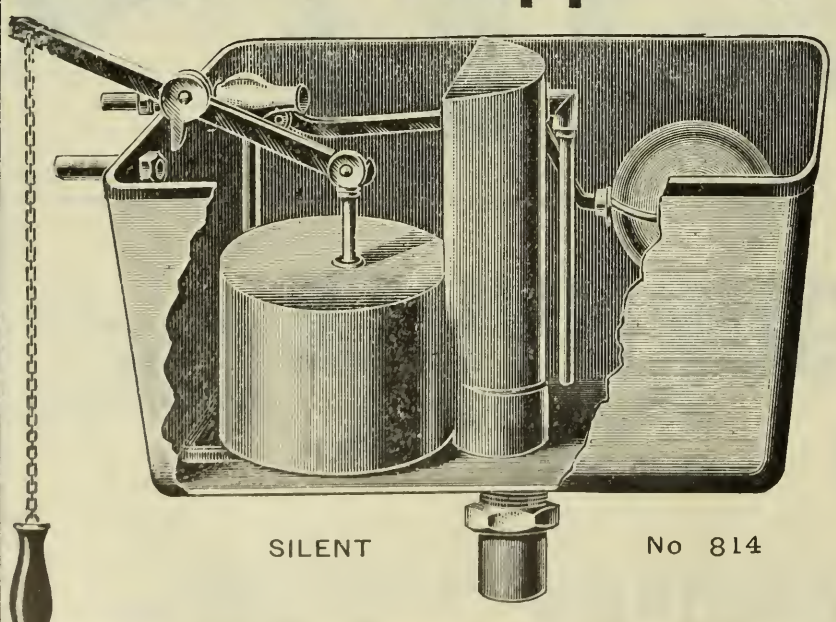

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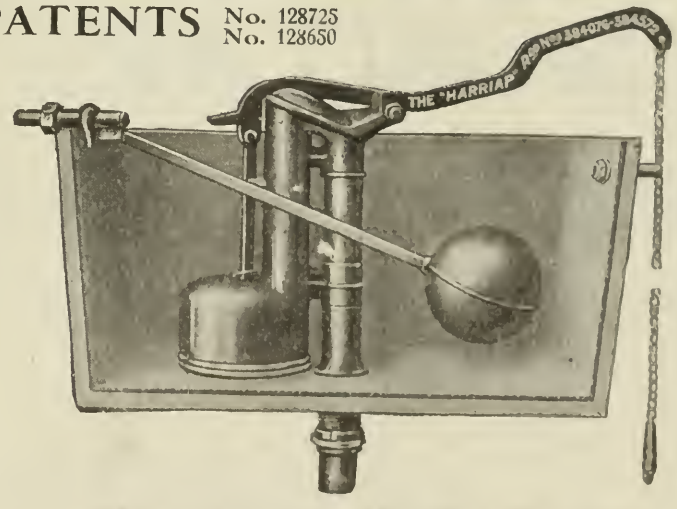

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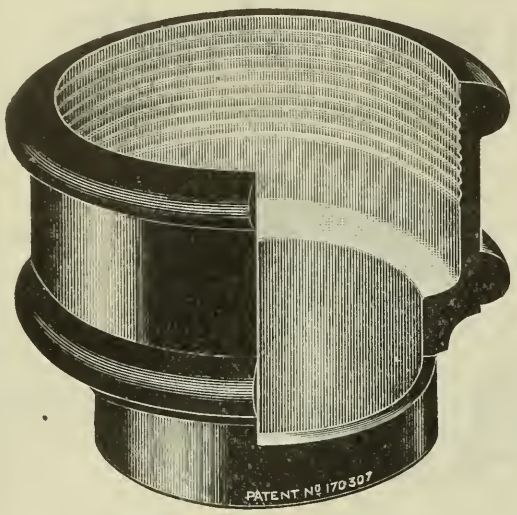

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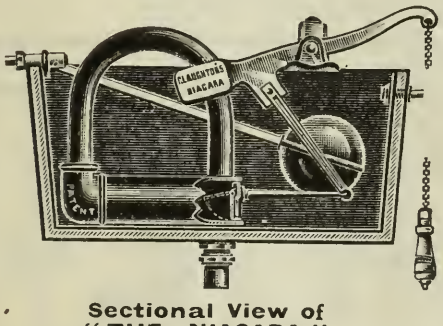
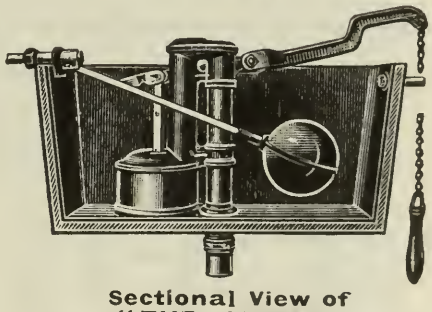


Sectional View of "THE NIAGARA."
Bronze Medal, Health Exhibition, Leeds, 1897.



Sectional View of "THE JAPKAP."
Bronze Medal, Health Exhibition, York, 1912
Do. do. do. Birmingham, 1920

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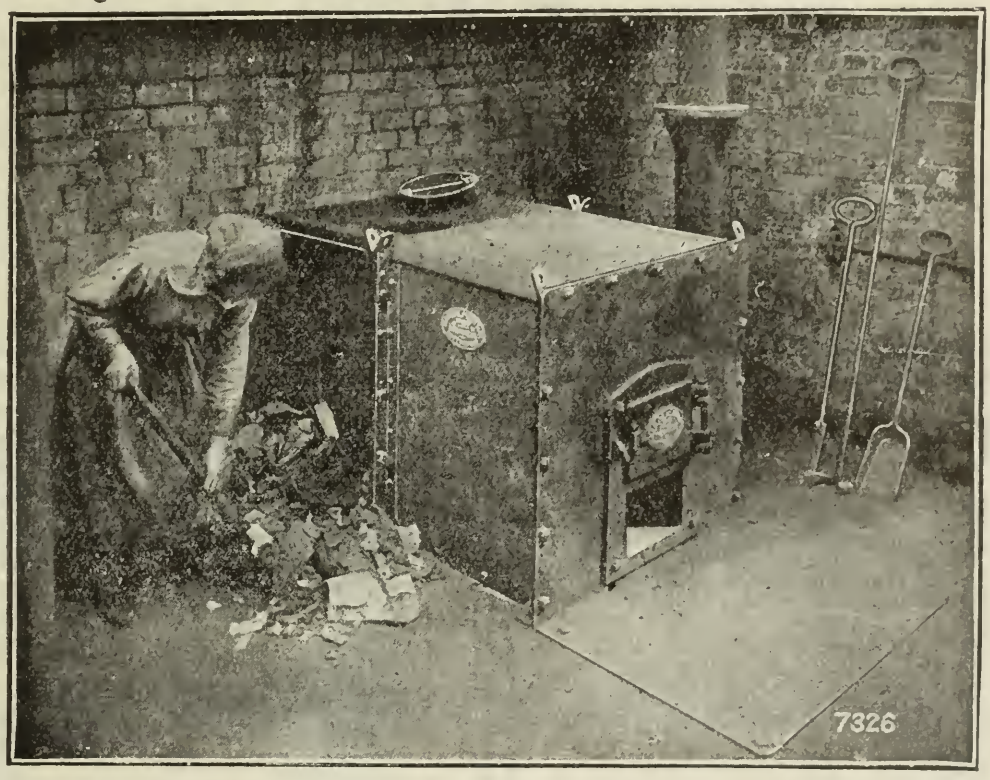

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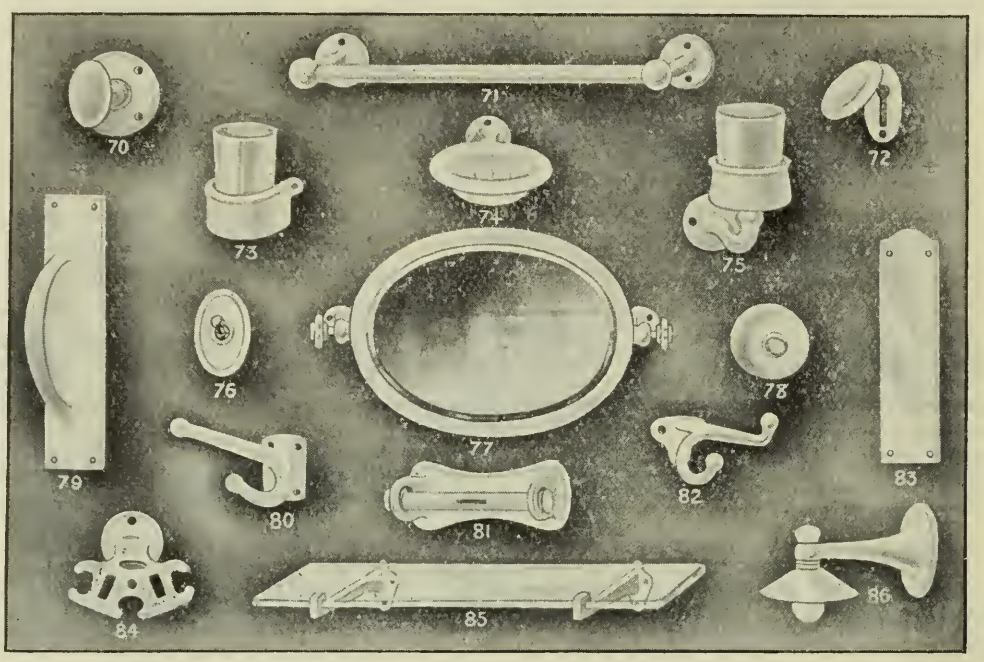

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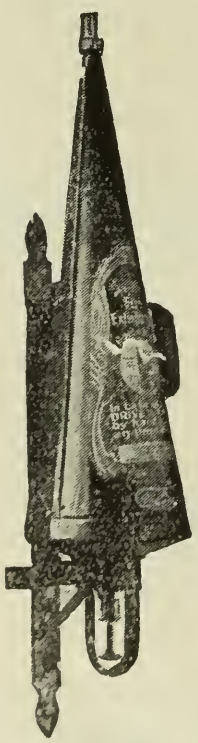

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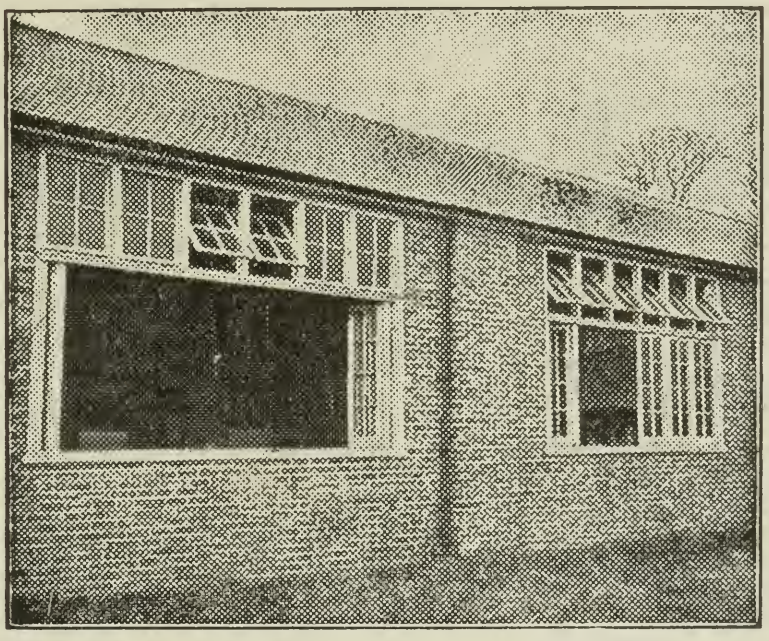

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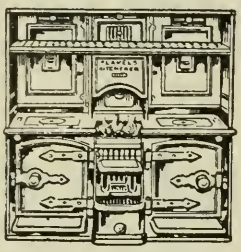

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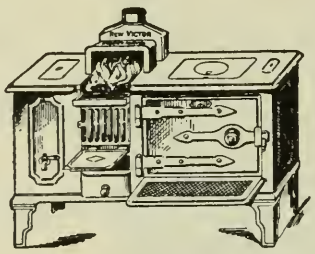

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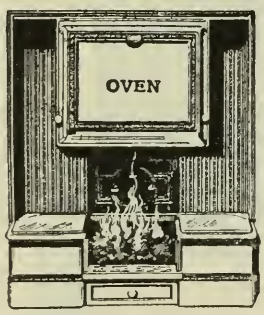

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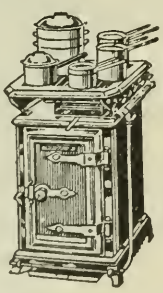

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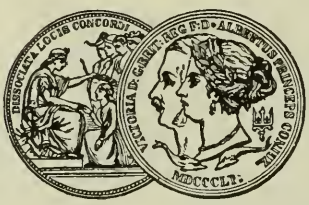

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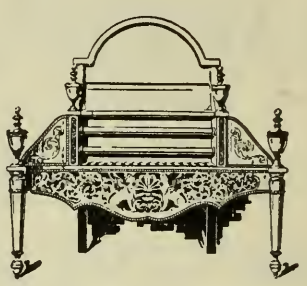

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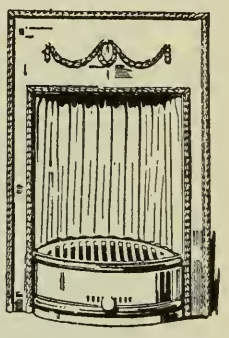

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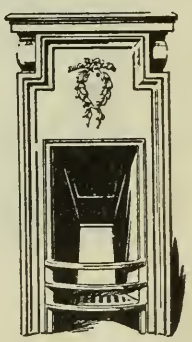

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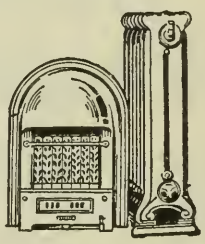

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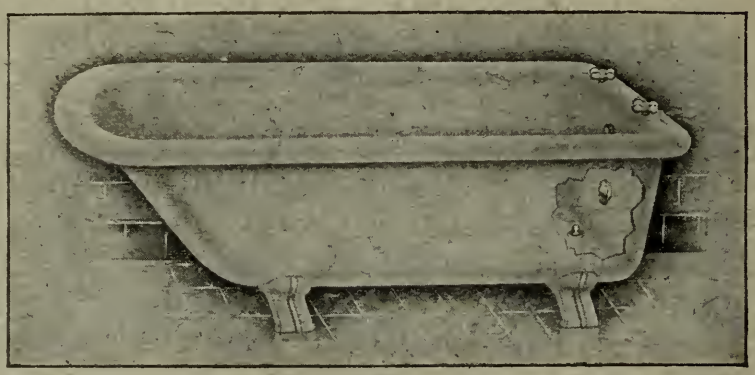

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